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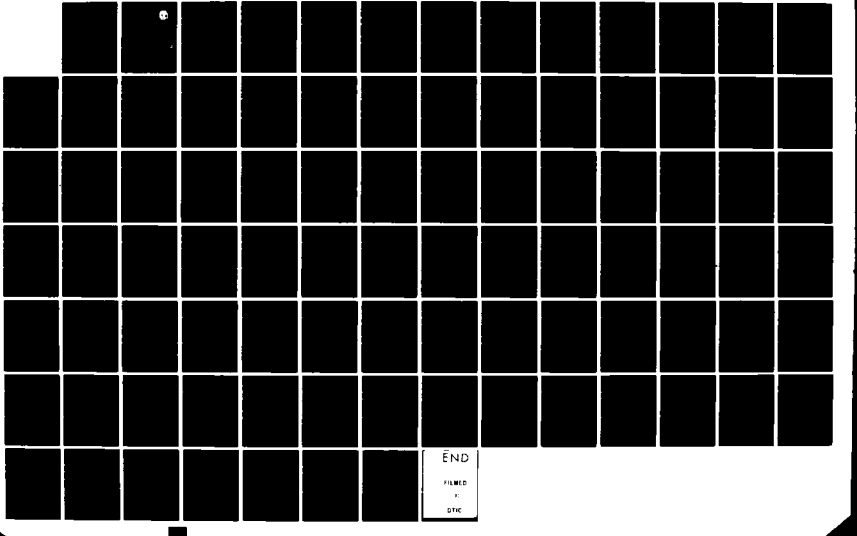

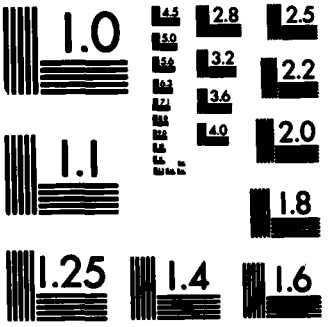

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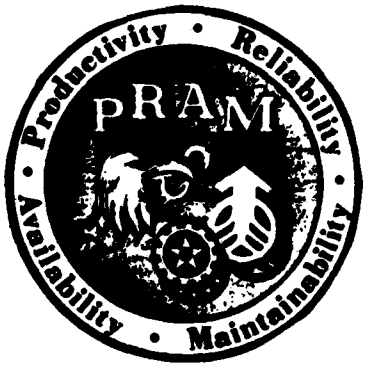

ANALYSIS OF UNITED STATES AIR FORCE AIRCRAFT ACCUMULATORS

PRODUCTIVITY, RELIABILITY, AVAILABILITY, AND MAINTAINABILITY PROGRAM OFFICE

NOVEMBER 1982

FINAL REPORT FOR PERIOD MARCH - APRIL 1982

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

AERONAUTICAL SYSTEMS DIVISION
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

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This report summarizes USAF aircraft hydraulic system accumulator installations and failure history. The purpose of this effort was to identify and select an appropriate installation for flight test of an improved accumulator of the metal bellows design. A test aircraft installation was identified.

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PREFACE

This report summarizes the results of identifying and analyzing United States Air Force (USAF) aircraft hydraulic accumulators. The goal was to identify an aircraft that had an accumulator with high maintenance requirements and physical characteristics similar to a newly designed low maintenance accumulator. This aircraft would be used as the test-bed for the new accumulator. The analysis was accomplished by USAF Reserve Officers and sponsored by the Productivity, Reliability, Availability and Maintainability (PRAM) Program Office of the Aeronautical Systems Division (ASD), Wright-Patterson Air Force Base, Ohio 45433.

The work reported herein was performed during the period March through April 1982, under the direction of the author, Captain Carmine J. Forzono, USAFR (ASD/XOR).

The author wishes to thank the following reservists: Major Thomas Gardner, Major Ron Harvey, Captain Franklin Denyse, and 1Lt Fred Roberts for their assistance in compiling some of the data found in this report. Appreciation is also extended to Mrs. Emily Patrick (AFALD/PTD) for her help in obtaining many of the required drawings.

A

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SECTION I

INTRODUCTION

Included within this report is the description of the processes undertaken and the information gathered to identify the test-bed aircraft for a new low maintenance accumulator. The project required that all accumulators on USAF aircraft be identified, their maintenance history be established, and their dimensional characteristics be recorded. With these factors known, a particular accumulator on a specific aircraft would be recommended as the most favorable candidate for replacement with the new low maintenance accumulator for flight testing.

1. Objective and Overall Approach

The goal was to identify a USAF aircraft that had an accumulator with a poor maintenance history. It was hoped that the identified accumulator would be compatible with the size of the new low maintenance accumulator being developed by the Aero Propulsion Laboratory. Two of these new accumulators were being built. Both were 100 cubic inches in volume. One was going to be laboratory tested by the Aero Propulsion Laboratory, the other flight tested. It is the latter one that this report addresses. These two accumulators were developed as a result of the work recorded in another report titled "Low Maintenance Hydraulic Accumulator" (AFWAL-TR-81-2031). The AFWAL-TR-81-2031 report contains detailed descriptions of the design of these low maintenance accumulators. A copy of the abstract from this report is presented below:

"This report presents the results of a program to develop a low maintenance accumulator, compatible with current MS envelopes and competitive in cost with conventional accumulators. The purpose of the program was to select and develop a metal bellows configuration/concept to replace the conventional moving piston and seal of conventional accumulators. The selected bellows is of welded construction and welded in place to allow bellows movement identical to piston movement. The accumulator housing is of welded construction to eliminate all possible leak points. The program goal was to develop an accumulator to provide a ten year unserviced life. Test results indicate an accumulator design is possible to achieve a service life of six to ten years based on installation on a F-16 aircraft."

2. Note

There were a few constraints in this analysis to identify a likely flight test aircraft for the new low maintenance accumulator. The first and most severe was that of time. The sponsor desired a quick response (no more than one month). It was hoped that an answer could be provided at the end of a two week reserve tour that began on 8 March 1982; however, due to computer run problems, only a first-cut verbal answer was provided at that time. This report, written in the second week of April 1982, presents the final recommendation. The time factor prevented a more extensive search of technical orders and the acquiring of all accumulator drawings, but this did not adversely effect the end results.

Another constraint was finding an accumulator near 100 cubic inches in gas volume. Although 100 cubic inches was not a firm requirement by PRAM Program Office, it was used as a norm.

SECTION II

APPROACH

To accomplish the task of this report, five basic elements had to be accomplished. First, the USAF aircraft involved had to be identified. Second, the accumulators on those aircraft had to be identified. Third, the maintainenance data/ history of each accumulator had to be recorded. Fourth, part numbers were needed to obtain drawings from which accumulator sizes could be obtained. The last element involved the actual review of information gathered and recommendation of an aircraft/ accumulator location for the new low maintenance accumulator.

1. Aircraft Involved

It was decided to investigate only accumulators on aircraft that were relatively modern, in present use by the active USAF, and potential candidates for some type of retrofit with these new low maintenance accumulators, if practicable. The following aircraft were selected:

KC-135A	C-141
RC-135A & C	C-130, B & E
WC-135B	F-111A, D, E & F
A-7D	FB-111A
A-10	F-15
B52G & H	F-4C, D & E
C-5A	F-16A & B

2. Accumulator Identification

It was felt that the best approach toward identifying the accumulators on each aircraft was to review the individual aircraft Work Unit Code (WUC) Manuals. Each of these manuals is

denoted as a technical order (T.O.) for each aircraft; eg, T.O. 1C-5A-06. They are all known as the Dash 6 T.O. for each specific aircraft. An attempt was made at using other aircraft T.O.s, like those dealing with hydraulic or landing gear maintenance and description; however, these efforts were very tedious and proved unsuccessful. Also, by obtaining the WUC for each accumulator, the task of obtaining maintenance data was made easier.

3. Maintenance Data

The AFLC Q-D056B computer maintenance reporting system was used in obtaining maintenance data on each accumulator. With the WUCs known, it was just a matter of pulling microfiche sheets from specific reports to obtain data.

The HQ AFLC/LOE (B06) report "Maintenance Actions, Man-hours and Aborts by Work Unit Code" was the major report used. A description of this report can be found in Appendix C. A sample of the data presented in this B06 report is shown in Figure 1. Each report contains data for six months. To provide a more reliable Mean Time Between Maintenance (MTBM) figure, a two-year time span was used. To accomplish this, four consecutive six-month microfiche histories were recorded and used to get the final two year MTBM.

Follow the steps and explanations below to better understand the process.

(1) With the WUC and aircraft known, the B06 data was obtained. For example, in Figure 1 the aircraft is the RC-135A

RC-135A

MAINTENANCE ACTIONS, MANHOURS, AND ABORTS BY WORK UNIT CODE PERIOD ENDING 81DEC31 • H03• 02/01/25 [illegible] RCS: LOG-LOE(AR)7176 PAGE 63

ALC: OCALC TYP EQP: ACF EAD: RC135A WUC: 13CDF

WUC / NOUN	MONTH	INV	OP TIME	ABO	MAINT ACTION FAIL	MAINT ACTION OTH/MAL	MAINT ACTION TOT	MTBM TYPE-1	MTBM TOTAL	MANHOURS SCHED	MANHOURS UNSCH	MANHOURS SHOP	SHOP ACTION UNITS RTOK	SHOP ACTION UNITS CONDM	SHOP ACTION UNITS NRTS
13CDF ANTI SKID VALVE	DEC	19	409					4703	2302						
CAT OPS ACT LMT USE FACT	NOV	[illegible]	[illegible]					[illegible]	[illegible]		6	3		1	
B 4 2011 1.00	OCT	[illegible]	[illegible]		1		2	4462	[illegible]	8		3	1		
	JUL	18	[illegible]						[illegible]						
	TOTALS		2425		1		2	9711	[illegible]	8	6	6	1	1	
13COJ REBOOST VALVE	DEC	19	409				1	2302	707			8			1
CAT OPS ACT LMT USE FACT	NOV	[illegible]	[illegible]					[illegible]	[illegible]						
B 4 1422 1.00	OCT	[illegible]	[illegible]		2		5	2221	[illegible]	1	5				
	SEP	[illegible]	[illegible]						[illegible]			6			2
	AUG	26	[illegible]				1		[illegible]						
	TOTALS		2425		2		[illegible]	4856	[illegible]	1	5	14			3
13CDL PRESS RELIEF VALVE	DEC	19	409				2		2302		4				
CAT OPS ACT LMT USE FACT	OCT	[illegible]	[illegible]						[illegible]						
C 4 1.00	SEP	[illegible]	[illegible]						[illegible]						
	AUG	26	[illegible]			1	1		[illegible]		2				
	TOTALS		2425			1	3		3237		[illegible]				
13CDM RESERVE BRAKE ACCUM	DEC	19	409		1		1	1196	[illegible]		[illegible]	2	1		
CAT OPS ACT LMT USE FACT	NOV	[illegible]	[illegible]				1		[illegible]		[illegible]				
C 1 343 1.00	OCT	[illegible]	[illegible]						[illegible]						
	SEP	[illegible]	[illegible]				1	[illegible]	[illegible]		[illegible]				
	AUG	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]		[illegible]				
	JUL	18	[illegible]		[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	1	1		
	TOTALS		2425		3		7	809	347		43	3	2		
13CDP ACCUM SELECTOR VAL	DEC	19	409									2			
CAT OPS ACT LMT USE FACT	OCT	8	[illegible]												
C 2 1.00	TOTALS		2425									2			
13CDT RELIEF VALVE	DEC	19	409									3	1		
CAT OPS ACT LMT USE FACT C 2 1.00	TOTALS		2425									3	1		
13CXX SUBSYSTEM SUMMARY	DEC	19	409		[illegible]	2	50	[illegible]	[illegible]	35	[illegible]	219	113	1	3
CAT OPS ACT LMT USE FACT	NOV	[illegible]	[illegible]		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
1 1.00	OCT	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	92	[illegible]	[illegible]
	SEP	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]
	AUG	[illegible]	[illegible]		7	2	40	[illegible]	[illegible]	[illegible]	30	[illegible]	130	21	[illegible]
	JUL	18	[illegible]		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	TOTALS		2425		34	8	223	[illegible]	[illegible]	156	232	422	[illegible]	[illegible]	[illegible]
13DAO LG CNTL MECH ASSY	DEC	19	409					1230	1230						
CAT OPS ACT LMT USE FACT	NOV	[illegible]	[illegible]					[illegible]	[illegible]						
C 1 1.00	OCT	[illegible]	[illegible]					[illegible]	[illegible]						
	SEP	24	[illegible]		1		1	[illegible]	[illegible]		[illegible]				
	TOTALS		2425		1		1	2427	2427		[illegible]				

Figure 1 - Sample B06 Data

and WUC is 13 CBM. The six month average MTBM (Type -1) is 809. The MTBM (total) figure is not used because it includes all maintenance actions such as moving the accumulator to get to another part. MTBM (Type -1) only includes maintenance actions resulting from a failure. The total number of failures, "3", and total operating time, "2425", was also recorded.

(2) Since the data shown in Figure 1 only provided six months of information, the previous three six-month periods of data were also recorded for each accumulator on each aircraft. The compiling of all this data, including the MTBM, number of failures, and total operating time for six-month periods for the accumulators, on all aircraft studied, is presented in Appendix B.

(3) To get a two year average MTBM, the two year total of operating hours was divided by the two year total of failures. These MTBMs are found at the bottom of each sheet presented in Appendix B.

The original B06 and other D056 reports can be viewed or obtained from Headquarters Air Force Logistics Command (HQ AFLC). The AFLC personnel that provided assistance in obtaining these reports were Chuck Gross and Bob Newman, of AFLC/LOEP, Wright-Patterson Air Force Base (W-PAFB), Ohio 45433 ((513) 257-2257/6060).

4. Obtaining Part Numbers

Getting a match between the WUC, which leads to the maintenance data, and a part number (P/N), was somewhat difficult.

The personnel responsible for the D056 system advised that there was no correlation in this report between WUCs and P/Ns. The Illustrated Parts Breakdown (IPB) T.O.s were searched in an effort to match up brief WUC descriptions with drawings in the same IPBs to get P/Ns. This was extremely difficult and unreliable. D056 personnel advised that the B05 report, "Summarized Maintenance Actions for Selected WUCs", had in it's output, part numbers. It should be recalled that P/Ns were needed to get the drawings of the accumulators so that their sizes could be obtained. A description of the B05 report and a sample of its six month microfiche output can be found in Appendix C.

Unfortunately, the six month microfiche B05 report only reports data on WUCs that have fallen below their recommended MTBM. Very few accumulators had this reputation. It was then discovered that a full year special computer run could be obtained that would print out B05 data on each WUC regardless of the MTBM. A sample of this B05 data is shown in Figures 2a, 2b, and 2c. As shown in these figures, the Emergency Brake Accumulator, WUC 13DEC had four different part numbered accumulators associated with it: 1356633402, 60001-3, 600013 and MS287973. The P/Ns 60001-3 and 600013 are the same, except the "-" was left out in the latter. This one year B05 computer output worked out quite well for obtaining part numbers of accumulators. However, some accumulators did not receive any maintenance during that one year and, therefore, part numbers could not be obtained. These were apparently accumulators with very

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SUMMARIZED MAINTENANCE ACTIONS FOR SELECTED WORK UNIT CODES 82/04/04 Q-D0568-B05-WK-417 PAGE 1
PERIOD ENDING 82FEB28 RCS: LOG-LOE(AR)7179

ALC:SMALC RCN: MC2764 TYP EQP: ACF EAD: A010A WUC: 13DEC
ACUMULATOR EMERG BK CAT IND C
PART I - ON EQUIPMENT ACTIONS

--HOW MALFUNCTION-- CODE	NOUN	CURR MO UNIT FAIL	CURR MO COUNT OTHMAL	TWELVE MONTH UNIT FAIL	TWELVE MONTH COUNT OTHMAL	F REPR	PR REM	G ATCH	KL ADJ	Z CRSN	V CLN	X TEST	S RER	EMJ OTHER	TWELVE MONTH UNITS	TWELVE MONTH M/HRS
TYPE 1																
870	BROKEN		1		2			2							2	8.2
127	ADJUST IMPROP			6					6						6	12.5
135	STUCK OR JAM			1					1						1	3.0
178	CORR-MILD/MOD	3		36			2			34	3				39	26.8
198	CRACKED		1	1	1		1	1							2	22.0
374	INTERNAL FAIL			4			5								5	20.9
381	LEAKING	4		36	3		32	3	4			1			40	420.6
525	PRESS INCORRECT			1					1			5			6	15.8
561	CANT ADJUST			1					1						1	14.0
651	AIR IN SYSTEM			1			1								1	8.0
730	LOOSE				2			2							2	1.3
	TOTAL	7	2	87	8		41	8	13	34	3	6			105	553.1
TYPE 2																
165	BOLTS LOOSE		1		6			6							6	9.3
166	BOLTS MISSING				1			1							1	.5
168	BRKN SAFTY WR				1			1							1	.3
230	DIRTY										3				3	1.1
948	OPER ERROR													1	1	6.0
	TOTAL		1		8			8			3			1	12	19.2
TYPE 6																
799	NO DEFECT						3	1				14		1	19	114.8
800	NO D FAC MAIN						2								2	21.5
805	NO DEF NOC											1			1	2.0
	TOTAL						5	1				15		1	22	139.3
	WUC TOTAL	7	3	87	16		46	17	13	34	6	21		2	139	710.6
12 MONTHS UNITS & MANHOURS FOR OTHER ACTIONS			A/T UNITS Q		HOURS .0	A/T UNITS T		HOURS .0	A/T UNITS U		HOURS .0	A/T UNITS Y		HOURS .0	A/T UNITS INVL		HOURS .0
COMMAND BASE																
AFE	BENTWTRS RAF UK	27	7	27	7		11	8	6	13	4	1			43	97.9
	TOTAL	27	7	27	7		11	8	6	13	4	1			43	97.9
AFR	BARKSDALE AFB L		2		2			2				1			3	28.7
AFR	GRISSOM AFE IND	1		1					1						1	1.0
	TOTAL	1	2	1	2			2	1			1			4	29.7
ANG	BRADLEY NG GUN	1		1			1								1	8.0
ANG	MARTIN NG MD	3		3						3					3	2.0
	TOTAL	4		4			1			3					4	10.0
LOG	SMALC MOD	2		2						2					2	1.0
	TOTAL	2		2						2					2	1.0
TAC	DAVIS MON AFB A	13	5	13	5		11	5	3			4			23	121.2
TAC	ENGLAND AFB LA	21		21			20		1			11			32	315.0
TAC	MRTLE BCH AB SC	19	2	19	2		3	2	3	15	2	4		2	31	135.8
	TOTAL	53	7	53	7		34	7	7	15	2	19		2	86	572.0
	WUC TOTAL	87	16	87	16		46	17	13	34	6	21		2	139	710.6

Figure 2(a) - Sample B05 Data

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SUMMARIZED MAINTENANCE ACTIONS FOR SELECTED WORK UNIT CODES 82/04/04 Q-00568-805-WK-417 PAGE 2
PERIOD ENDING 82FEB28 RCS: LOG-LOE(AR)7179
ALC:SMALC PCN: MC2764 TYP EQP: ACF EAD: AB10A MUC: 130EC
ACUMULATOR EMERG BK CAT IND C
PART II - SHOP ACTIONS

FSC 1650 P/N 1356633402 - NIIN/NMC 008996271

--NON MALFUNCTION--- CODE	NOUN	REPAIR AFG UNITS	REPAIR AFG HOURS	ADJUST KL UNITS	ADJUST KL HOURS	CLN/TEST/CRSN VXZ UNITS	CLN/TEST/CRSN VXZ HOURS	SRVCBLE BJ UNITS	SRVCBLE BJ HOURS	NRTS & CONDEMNED 1 2-6 7-8 9 UNITS	NRTS & CONDEMNED HOURS	TOTAL UNITS	TOTAL HOURS	DELAYED CONN UNITS	DELAYED CONN HOURS
381	LEAKING	1	14.8	.0	.0	.0	.0				.0	1	14.8		.0
	TOTAL	1	14.8	.0	.0	.0	.0				.0	1	30.8		.0
BASE	NOUN														
BHVH	BENTWTRS RAF UK	1	14.8	.0	.0	.0	.0				.0	1	14.8		.0
	TOTAL	1	14.8	.0	.0	.0	.0				.0	1	14.8		.0

FSC 1650 P/N 660J1-3 - NIIN/NMC 005846178

--NON MALFUNCTION--- CODE	NOUN	REPAIR AFG UNITS	REPAIR AFG HOURS	ADJUST KL UNITS	ADJUST KL HOURS	CLN/TEST/CRSN VXZ UNITS	CLN/TEST/CRSN VXZ HOURS	SRVCBLE BJ UNITS	SRVCBLE BJ HOURS	NRTS & CONDEMNED 1 2-6 7-8 9 UNITS	NRTS & CONDEMNED HOURS	TOTAL UNITS	TOTAL HOURS	DELAYED CONN UNITS	DELAYED CONN HOURS
381	LEAKING	5	56.5	.0	.0	.0	.0				.0	5	56.5	1	16.8
525	PRESS INCORRECT	1	4.8	.0	.0	.0	.0				.0	1	4.8		.0
651	AIR IN SYSTEM	2	8.8	.0	.0	.0	.0				.0	2	8.8		.0
	TOTAL	8	68.5	.0	.0	.0	.0				.0	8	68.5	1	16.8
BASE	NOUN														
FBNV	DAVIS MON AFB A	4	20.8	.0	.0	.0	.0				.0	4	20.8	1	16.8
RDRD	MRTLE BCH AB SC	2	36.8	.0	.0	.0	.0				.0	2	6.8		.0
RKMF	NELLIS AFB NEV	2	12.5	.0	.0	.0	.0				.0	2	12.5		.0
	TOTAL	8	68.5	.0	.0	.0	.0				.0	8	68.5	1	16.8

FSC 1650 P/N 683013 - NIIN/NMC 0058+6178

--NON MALFUNCTION--- CODE	NOUN	REPAIR AFG UNITS	REPAIR AFG HOURS	ADJUST KL UNITS	ADJUST KL HOURS	CLN/TEST/CRSN VXZ UNITS	CLN/TEST/CRSN VXZ HOURS	SRVCBLE BJ UNITS	SRVCBLE BJ HOURS	NRTS & CONDEMNED 1 2-6 7-8 9 UNITS	NRTS & CONDEMNED HOURS	TOTAL UNITS	TOTAL HOURS	DELAYED CONN UNITS	DELAYED CONN HOURS
381	LEAKING	17	94.3	.0	.0	.0	.0			1	1.4	18	95.7	1	3.8
	TOTAL	17	94.3	.0	.0	.0	.0			1	1.4	18	95.7	1	3.8
BASE	NOUN														
BHVH	BENTWTRS RAF UK	5	29.6	.0	.0	.0	.0				.0	5	29.6	1	3.8
GAMH	ENGLAND AFB LA	12	64.7	.0	.0	.0	.0			1	1.4	13	66.1		.0
	TOTAL	17	94.3	.0	.0	.0	.0			1	1.4	18	95.7	1	3.8

FSC 1650 P/N MS287973 - NIIN/NMC 000555138

--NON MALFUNCTION--- CODE	NOUN	REPAIR AFG UNITS	REPAIR AFG HOURS	ADJUST KL UNITS	ADJUST KL HOURS	CLN/TEST/CRSN VXZ UNITS	CLN/TEST/CRSN VXZ HOURS	SRVCBLE BJ UNITS	SRVCBLE BJ HOURS	NRTS & CONDEMNED 1 2-6 7-8 9 UNITS	NRTS & CONDEMNED HOURS	TOTAL UNITS	TOTAL HOURS	DELAYED CONN UNITS	DELAYED CONN HOURS
381	LEAKING	1	15.2	.0	.0	.0	.0				.0	1	15.2		.0
799	NO DEFECT		.0	.0	.0	.0	.0	1	2.3		.0	1	2.3		.0
	TOTAL	1	15.2	.0	.0	.0	.0	1	2.3		.0	2	17.5		.0
BASE	NOUN														

Figure 2(b) - Sample B05 Data

DISTRIBUTION: AFLC/LOEP

SUMMARIZED MAINTENANCE ACTIONS FOR SELECTED WORK UNIT CODES 82/04/04 Q-00568-B05-WK-N17 PAGE 3
PERIOD ENDING 82FEB29 RCS: LOG-LOE(AR)7179
ALC:SMALC RCN: MC2764 TYP EQP: ACF EAD: A310A WUC: 13DEC
ACUMULATOR EMERG BK CAT IND C
PART II - SHOP ACTIONS

BHVW	BENTWTRS RAF UK	1	15.2		.0		.0	1	2.3				.0	2	17.5	.0
	TOTAL	1	15.2		.0		.0	1	2.3				.0	2	17.5	.0
	FSC 1650 P/N 8842303O1			UNITS	1				FSC 1650 P/N 8884230301			UNITS		1		
	FSC 1650 P/N 8884230321			UNITS					FSC 1650 P/N 1356583323			UNITS		1		
	FSC 1650 P/N 5456A			UNITS	1				FSC 6178 P/N 680813			UNITS				
	FSC 8165 P/N 8680813			UNITS	1											

--MDW MALFUNCTION--- CODE	NOUN	REPAIR AFG UNITS	REPAIR AFG HOURS	ADJUST KL UNITS	ADJUST KL HOURS	CLN/TEST/CRSN VXZ UNITS	CLN/TEST/CRSN VXZ HOURS	SRVCBLE BJ UNITS	SRVCBLE BJ HOURS	NRTS & CONDEMNED 1	NRTS & CONDEMNED 2-6	NRTS & CONDEMNED 7-8	NRTS & CONDEMNED 9	TOTAL UNITS	TOTAL HOURS	DELAYED COMN UNITS	DELAYED COMN HOURS
										------UNITS------							
381	LEAKING	4	44.8		.0		.0		.0					.0	4	44.8	.0
799	NO DEFECT		.0		.0		.0	1	2.2					.0	1	2.2	.0
	TOTAL	4	44.8		.0		.0	1	2.2					.0	5	47.0	.0

BASE	NOUN																
AWUB	BARKSDALE AFB L	1	11.7		.0		.0		.0					.0	1	11.7	.0
GAMH	ENGLAND AFB LA	3	33.1		.0		.0	1	2.2					.0	4	35.3	.0
	TOTAL	4	44.8		.0		.0	1	2.2					.0	5	47.0	.0

	REPAIR AFG UNITS	REPAIR AFG HOURS	ADJUST KL UNITS	ADJUST KL HOURS	CLN/TEST/CRSN VXZ UNITS	CLN/TEST/CRSN VXZ HOURS	SRVCBLE BJ UNITS	SRVCBLE BJ HOURS	NRTS & CONDEMNED 1	NRTS & CONDEMNED 2-6	NRTS & CONDEMNED 7-8	NRTS & CONDEMNED 9	TOTAL HOURS	TOTAL UNITS	TOTAL HOURS
									--------UNITS--------						
WUC TOTAL	31	237.6		.8		.8	2	4.5	1				1.4	34	259.5

Figure 2(c) - Sample B05 Data

high MTBMs or were on a fleet of aircraft that had very low operating hours for the year. A two year printout was requested to resolve these few oddities; however, only one year's data is kept on the computer.

The total compilation of P/Ns obtained for specific WUC is presented on data sheets found in Appendix A.

5. Reviewing the Data

This last part of the report deals with reviewing the maintenance history, accumulator physical characteristics, developing results, conclusions, and recommendations.

SECTION III

RESULTS

The data presented in Appendix A provides the greatest amount of information on the accumulators. There is one sheet per aircraft type. On the left of each sheet is the WUC of each accumulator on that aircraft. These are followed to the right by the P/N(s), vendor code, gas volume, length, diameter, and two year average MTBM for each accumulator. Some blocks are not filled in because the drawings were not available at the Engineering Data Office (AFALD/PTD) at W-PAFB, OH. As explained earlier, the computer only stores one year of B05 data, and, therefore, a few P/Ns are missing.

Figure 3 presents aircraft having accumulators with a two year average MTBM of less than 2000 operating hours. This figure of 2000 operating hours was arbitrarily chosen. It was felt that by looking only at accumulators with low MTBMs the best test-bed aircraft would be identified. Also, the PRAM sponsor felt that it would be best to flight test the new low maintenance accumulator in place of an accumulator that had a proven history of a low MTBM. In this way, a successful flight test might be followed by a retrofit of that particular fleet of aircraft.

The KC-135/RC-135 series of aircraft have the largest number of accumulators with the lowest MTBMs, as is shown in Figure 3. The other important fact concerning these KC-135/RC-135 accumulators is that they match the 100 cubic inch size of the newly designed low maintenance accumulator.

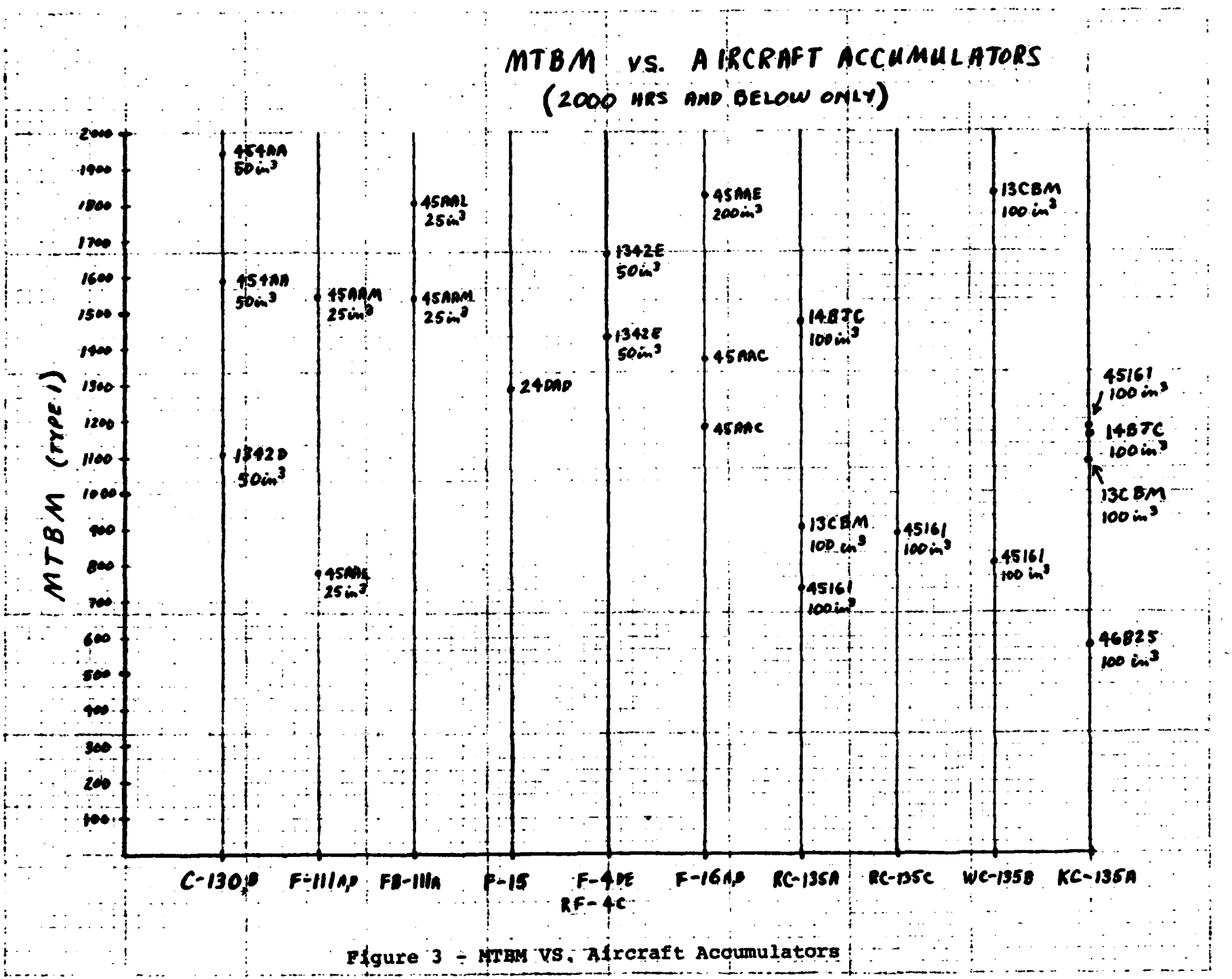

Figure 3 - MTBM VS. Aircraft Accumulators

SECTION IV

CONCLUSION

The goal of this report is to investigate the accumulators found on most USAF aircraft, to record their maintenance history and physical characteristics, and to identify accumulators with low MTBFs that had physical characteristics similar to the newly designed low maintenance accumulator. This goal was accomplished. The major compilation of data presented in this report is found in Appendix A.

Conclusions are:

(1) The KC/RC-135 series aircraft have the most accumulators with the lowest MTBM values, and are physically similar to the newly designed low maintenance accumulator.

(2) Accumulators have a very broad range of MTBM values; ranging from lows of 570 and 778 MTBM on the KC-135A and F-111B aircraft, respectively to highs of 23,664 and 105,053 MTBM on the A-7 and C-5A aircraft respectively.

SECTION VI

RECOMMENDATIONS

Recommend that the boom system accumulator (WUC 46825) on the KC-135 series aircraft be given serious consideration as the flight test installation for the new low maintenance accumulator. The accumulators on these aircraft have the worst maintenance history, and their sizes are compatible with the new design. There are approximately 640 KC-135A aircraft, 20 WC-135A aircraft and 25 RC-135 aircraft. With this number of accumulators in service, there might well prove to be a possible retrofit candidate if the testing demonstrates a sizable reduction in maintenance costs.

Recommend that the low maintenance accumulator test program include an investigation as to why some accumulators have such high MTBMs. Many are over 10,000 aircraft operating hours.

Lastly, recommend this report be provided to hydraulic engineers and designers throughout industry and the government as it represents the only effort to analyze and compare historical data on hydraulic accumulator operating experience.

APPENDIX A

COMPILATION OF

ACCUMULATOR MTBM HISTORICAL DATA

Published By:

PRAM
ASD/RA
Wright-Patterson AFB, OH 45433
AV 785-6632

RC-135 (A,C)
KC-135 A
WC-135 B

ACCUMULATOR DATA FOR

	ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	MIN	AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
*	13CBM	Reserve Brake	S513-100 (89307) →			100	20 3/8	3 3/16	RC-135A; - 908 RC-135C; - 2,620 KC-135A; - 1,092 WC-135B; - 1,831
			MS 28700-4 →	108	92	100	20 3/8		
			1008700-4 (77068) —						
			1356-542903 (92003) —						
*	14BJC	Rudder	S 513-100 (89307) →			100	20 3/8	3 3/16	RC-135A; - 1,476 RC-135C; - 3,556 KC-135A; - 1,153 WC-135B; - 2,518
			MS 28700-4 →	108	92	100	20 3/8		
			1008700-4 (77068) —						
			1356-542903 (92003) —						
*	45161	Hyd System	MS 28700-4 →	108	92	100	20 3/8	3 3/16	RC-135A; 738 RC-135C; 889 KC-135A; 1,166 WC-135B; 806
			S 513-100 (89307) →			100	20 3/8		
			MS 28700-2,-3 →	54	46	50	20 3/8	2 1/2	
			S 513-50 (89307) →			50	12 1/2		
			1356-512465 (92003) —						
*	46825	Air Refueling Sys; Boom	MS 28700-4 →	108	92	100	20 3/8	3 3/16	RC-135A; ∞ ? RC-135C; 2,489 KC-135A; 570
			S 513-100 (89307) →			100	20 3/8		
			1356-512471 (92003) —						
			1008700-4 (77068) —						
	69YKE	Cable Cutter	MS 28700-1	27	23	25	12.5	2.25	RC-135C; 9,958 KC-135A; 2,740
	46994	Air Refueling Receiver	MS 28700- →	27	23	25	12.5	2.25	RC-135C; 16,596 KC-135A; 5,586
			1356-542903 (92003) —						
	69YUO								RC-135C; 6,224 KC-135A; 5,376

ACCUMULATOR DATA FOR A-7D

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	GAS VOL. in^3 MIN	GAS VOL. in^3 AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
13CAC	Emergency Landing Gear	215-22102-10 (80378) 3119820-10		154.6	142.5	17	4.5	7,227
13EBJ	Brake	1008594 (77068)			25	10.76	2.375	1,994
13ECC	Emergency Brake system	215-22102-8 (80378) 3119820-8		65	65	11	4.5	4,688
45AAG	PC #1 and RAT	60000-1 (89307) MS 28797-1	26.2 27	 23	25 25	12.5 12.5	2.25 2.25	23,664
45BAH	PC #2 and Arrest. Gear	1008594 (77068) 60000-1 (89307) 1356-633498 (92003)	 26.2		25 25	10.76 12.5	2.37 2.25	3,855
45CAH	PC #3 and Emerg. Flap Actuator System	210-32523-4 (80378) 60000-1 (89307) MS 28797-1	27 26.2 27	23 23	25 25 25	12.5 12.5 12.5	2.25 2.25 2.25	2,514

ACCUMULATOR DATA FOR A-10 A

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	MIN	AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
13 DEC	Emergency Brake	MS 287973-3	54	46	50	12.5	3.187	
		60001-3 (89307)			50	12.5	3.187	5291
		1356633402						
13GBC	Emergency Landing Gear Extension	60001-3 (89307)			50	12.5	3.187	14488
45 ACT	Left Hand Hyd Sys Boot Strap	~~1711089003~~ (Res)						8693
		~~1618 T 100-12~~ (Acc)						
		2730621 (92003)						
45 BCT	Right Hand Hyd Sys Boot Strap							8451

ACCUMULATOR DATA FOR B-52 (G,H)

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	MIN	AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
13EEG	BRAKES	MS 28700-3 S 513-50-1 (89307) 1356-542901 (92003)	54	46	50 50	12.5 12.5	3 3/16	G - 6298 H - 5588
14FGG	RUDDER ELEV ?	MS 28700-1 — 1356-552092 (92003) — 1356-583321 (92003)	27	23	25	12.5 12.5	2 1/4 2 1/4	G - 5868 H - 3970
14FGJ								G - 129,116
45CBX	OUTBOARD WING HYD	MS 28700-1 1356-542897 (92003)	27	23	25	12 1/2	2 1/4	G - 4611 H - 6286
46GCT	AIR REFUEL							G - 3489 H - 4715

ACCUMULATOR DATA FOR C-5A

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	GAS VOL. in^3 MIN	GAS VOL. in^3 AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
11LCH	Crew Door	MS 28700-5 1356-583318 (92003)	216	184	200	36 1/8	3 3/16	5,529
13AQN	MLG Door Emergency Unlock	4H90620-103 (98897)			500	61	5.2	13,702
13BDS	NLG Door Emergency Unlock	MS 28700-5 1356-583318 (92003)	216	184	200	36 1/8	3 3/16	105,053
13ECV	MLG Brake	4H90600-109A (98897) 2660396 M1 (92003)	416	365	390 400	32.62 32.62	4.75 4.8	3,502
13FCU	NLG Steering	4H90600-107A (98897) 2660394 M1 (92003)	108	92	100 100	17.18 17.18	3.25 3.34	17,509
45LAH	HYD System #1	4H90620-103 (98897)			500	61	5.2	11,672

ACCUMULATOR DATA FOR C-5A

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	GAS VOL. in^3 MIN	GAS VOL. in^3 AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
45LCH	HYD SYS #4	4H90620-103 (98897)			500	61	5.2	13131
45LER	RAT Emergency Sys	4H90600-107A (98897)	108	92	100	1218	3.25	52527

ACCUMULATOR DATA FOR C-141

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	GAS VOL. in^3 MIN	GAS VOL. in^3 AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
14ECK	Elevator Control	1356-593105(92003) — 920108(93835)			5	5.84	1.81	14,295
24FAE	Aux. Power Plant	1356-593105 (PARKER HANNIFIN) [TO 9H1-2-43-3] 1356-583320(92003) MC8181 (76050)			5	5.84	1.81	18,095
45CDO	Hydraulic System #3	1356-593105 (PARKER HANNIFIN) 1356-583320 (92003)			5	5.84	1.81	2,888

ACCUMULATOR DATA FOR C-130 (-, B, & E)

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	GAS VOL. in^3 MIN	GAS VOL. in^3 AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
* 1342D	Brakes	S 512-50-2 (89307) →			50	20 3/8	2.25	- 3,202
		MS 28700-2 →	54	46	50	20 3/8	2 1/4	B - 1,112
		1356-583315 (92003) —						E - 3,731
		8425-101 (14775) —						
454AA	Hyd. Utility System	S 512-50-2 (89307) →			50	20 3/8	2 1/4	- 1,946
		MS 28700-2 →	54	46	50	20 3/8	2 1/4	B - 1,580
		1356-589315 (92003) —						E - 2,079
		8421-101 (14775) —						
454AB	Hyd. Booster System	S 512-50-2 (89307) →			50	20 3/8	2 1/4	2,836
		MS 28700-2 →	54	46	50	20 3/8	2 1/2	B - 2,427
		1356-583315 (92003) —						E - 5,096
		8422-001 (14775) —						
454AC	Emergency Sys.	S 512-50-2 (89307) →			50	20 3/8	2 1/4	7,090
		MS 28700-2 →	54	46	50	20 3/8	2 1/4	B - 5,528
		1356-573079 (92003) —						E - 7,074
		8422-001 (14775) —						
454AD	Auxiliary Hyd. Sys.	MS 28700-1 →	27	23	25	12 1/2	2 1/4	VERY HIGH
		1356-552092 (92003) —	27	23	25	12 1/2	2 1/4	B - 3,109
								E - 3,885

ACCUMULATOR DATA FOR C-130B (Drone Retrieval System)

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	GAS VOL. in^3 MIN	GAS VOL. in^3 AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
17BDW	Aerial Rec Sup Wires							1448
17HHM	Aerial Rec Outer Door							543
17LAB	ATM HYD Recovery							869

ACCUMULATOR DATA FOR F-111 (A D E F)

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in³ MAX	GAS VOL. in³ MIN	GAS VOL. in³ AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
45AAK	Brake	2660075 M6 (92003)			75	16	3.14	A - 3506 D - 3842 E - 19270 F - 8217
45AAL	Damper Servo	2660075 M4 (92003)			25	11.19	2.18	A - 3068 D - 786 E1 - 2855 F - 5136
45AAM	Horizontal Stab	2660075 M4 (92003)			25	1619	2.18	A - 1550 D - 1520 E - 2336 F - 3573

ACCUMULATOR DATA FOR F-111(B) A

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	GAS VOL. in^3 MIN	GAS VOL. in^3 AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
45AAK	BRAKE	2660075 M6 (92003)			75	16	3.14	4907
45AAL	DAMPER SERVO	2660075 M4 (92003)			25	11.19	2.18	1808
45AAM	HORIZONTAL STAB	2660075 M4 (92003) SC-300-010			25	11.19	2.18	1544

ACCUMULATOR DATA FOR F-15

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	GAS VOL. in^3 MIN	GAS VOL. in^3 AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
12CBP	Canopy	893904 (Walter Kidde, 33525) [T.O. 9H1-2-57-3] 2710028 (Parker Hannifin, 92003) [T.O. 9H1-2-58-3]			50	20.2	2.08	2,705
24DAD	Jet Fuel Starter (THERE ARE TWO SAME SIZE)	2710996-2 (Parker Hannifin, 92003) T.O. 9H1-2-56-3						1,290

ACCUMULATOR DATA FOR F-4 (C, D, & E) & RF-4C

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	GAS VOL. in^3 MIN	GAS VOL. in^3 AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
1342E	Brakes	MS 28797-3 60001-3 (89307) 1356-633402M1 (92003)	54	46	50 50	12.5 12.5	3.187 3.187	C - 2802 D - 1667 E - 1654 RF - 1,432
4511E *	Hyd. System	No B4 Data to get P/Ns						C - ∞ D - 59,459 E - 59,135 RF - 158,786
4512C *	Hyd System	"						C - ∞ D - 16,216 E - 14,784 RF - 19,873
4513D *	Hyd. Utility Sys.	"						C - ∞ D - 178,378 E - 47,308 RF - HIGH
* no B4 Data								

ACCUMULATOR DATA FOR F-16 A, B

ACCUM. WUCs	USE/LOCATION	PART NUM. (Vendor Code)	GAS VOL. in^3 MAX	MIN	AVG	LENGTH in.	DIA. in.	MTBM (Jan 80-Dec 81) TYPE 1
45AAC	Flight Control System	8-8421-030-2 (YORK INR) [T.O. 9H1-2-63-2] 1356-583324M1 (PARKER HANNIFIN) [T.O. 9H1-2-5-143]						A 1,184 B 1,363
45AAD	Reserve System							A 6,396 B 5,964
45AAE	Brakes and Jet Fuel Starter	2750534M1 (PARKER-HANNIFIN) [T.O. 9H1-2-62-2]			200			A 1,827 B 3,976
45AAF	Deceleration Parachute							A Very High B N/A

APPENDIX B

ACCUMULATOR MTBM

HISTORICAL DATA

Published By:

PRAM
ASD/RA
Wright-Patterson AFB, OH 45433
AV 785-6632

TWO YEAR AVERAGE MTBM (TYPE 1) FOR KC-135A ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 13CBM QPA: 1 RESERG BRAKE MTBM	FAIL.	WUC: 14BJC QPA: 2 RUDDER MTBM	FAIL.	WUC: 45161 QPA: 1 HYD SYS MTBM	FAIL.	WUC: 46825 QPA: 1 BOOM SYS MTBM	FAIL.	WUC: 69YCE QPA: 1 CABLE CUTTER MTBM	FAIL.
JUL - DEC 81	107,900	972	111	884	244	1023	105	559	193	1346	80
JAN - JUN 81	108,542	1134	96	1022	192	1369	80	660	165	1413	77
JUL - DEC 80	104,858	1059	99	1256	167	1018	103	535	196		0
JAN - JUN 80	108,543	1233	88	1518	143	1348	81	540	201		0
TOTALS	430,143		394		746		369		755		157
TWO YEAR AVG. MTBMs		1092		1,153		1166		570		2,740	

(about 640 aircraft as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR KC-135A ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 69Y50 QPA: 1 MTBM	FAIL.	WUC: 69Y40 QPA: 1 MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	107,910	____	0	1346	80	____	____	____	____	____	____
JAN - JUN 81	108,842	____	0	____	0	____	____	____	____	____	____
JUL - DEC 80	104,858	1362	77	____	0	____	____	____	____	____	____
JAN - JUN 80	108,573	____	0	____	0	____	____	____	____	____	____
TOTALS	430,143		77		80		____		____		____
TWO YEAR AVG. MTBMs		5,586		5,376		____		____		____	

TWO YEAR AVERAGE MTBM (TYPE 1) FOR RC-135A ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 13CBM QPA: 1 RESERVE BRAKE MTBM	FAIL.	WUC: 14BJC QPA: 2 RUDDER MTBM	FAIL.	WUC: 45161 QPA: 1 HYD SYS MTBM	FAIL.	WUC: 46825 QPA: 1 AIR REFUEL. MTBM	FAIL.	WUC: QPA: MTBM	FAIL.
JUL - DEC 81	2425	809	3	694	7		0		0		
JAN - JUN 81	2862	955	3	5730	1	358	8		0		
JUL - DEC 80	3619	1206	3	1448	5	905	4		0		
JAN - JUN 80	2902	726	4	1935	3	726	4		0		
TOTALS	11,808		13		16		16		0		
TWO YEAR AVG. MTBMs		908		1476		738					

(about 20 aircraft, as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR RC-135C ACCUMULATORS

(Page 1 of 2)

TIME PERIOD	TOTAL OPER HOURS	WUC: 13CBM QPA: 1 RESERVE BRAKE MTBM	FAIL.	WUC: 14BJC QPA: 2 RUDDER MTBM	FAIL.	WUC: 45161 QPA: 1 HYD SYS MTBM	FAIL.	WUC: 46825 QPA: 1 AIR REFUEL. MTBM	FAIL.	WUC: 69YKE QPA: 1 MTBM	FAIL.
JUL - DEC 81	7335	5695	1	2847	5	670	11	814	9	____	0
JAN - JUN 81	13,203	1467	9	2201	12	660	20	6603	2	____	0
JUL - DEC 80	14,648	2096	7	5859	5	1046	14	2930	5	____	0
JAN - JUN 80	14,602	7301	2	4867	6	1327	11	3651	4	2716	5
TOTALS	49,788		19		28		56		20		5
TWO YEAR AVG. MTBMs		2,620		3,556		889		2,189		9,958	

(about 25 aircraft, as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR RC-135C ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 69Y50 QPA: 1 MTBM	FAIL.	WUC: 69Y40 QPA: 1 MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	7335	7343	1	3672	2						
JAN - JUN 81	13,203		0		0						
JUL - DEC 80	14,648	8038	2	8038	2						
JAN - JUN 80	14,602		0	4074	4						
TOTALS	49,788		3		8						
TWO YEAR AVG. MTBMs		16,596		6,224							

TWO YEAR AVERAGE MTBM (TYPE 1) FOR WC-135B ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 13 CBM QPA: 1 RESERVE BRAKE MTBM	FAIL.	WUC: 14 BJC QPA: 2 RUDDER MTBM	FAIL.	WUC: 45161 QPA: 1 HYD. SYS. MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	5,154	5156	1	2063	4	5156	1				
JAN - JUN 81	4,601	4603	1	1315	7	767	6				
JUL - DEC 80	5,123	1708	3	3415	3	466	11				
JAN - JUN 80	5,267	878	6	5267	2	752	7				
TOTALS	20,145		11		16		25				
TWO YEAR AVG. MTBMs		1,831		2,518		806					

(about 17 aircraft, as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR A-7D ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 13 CAC QPA: 1 EMER. L.G. MTBM	FAIL.	WUC: 13 EBJ QPA: 1 BRAKE MTBM	FAIL.	WUC: 13 ECC QPA: 1 EMER. BRAKE SYS MTBM	FAIL.	WUC: 45 AAG QPA: 3 PCB1 RAT MTBM	FAIL.	WUC: 45 BAN QPA: 1 PC #2 & AFT GEAR MTBM	FAIL.
JUL - DEC 81	39,977	9995	4	2104	19	3998	10	19,989	6	4997	8
JAN - JUN 81	40,717	4072	10	1697	24	6787	6	12,216	10	2909	14
JUL - DEC 80	46,574	9315	5	1663	28	4657	10	46574	3	3881	12
JAN - JUN 80	46191	9238	5	2887	16	3299	11	46191	3	4199	11
TOTALS	173,459		24		87		37		22		45
TWO YEAR AVG. MTBMs		7,227		1,994		4,688		23,664		3,855	

(about 360 aircraft)
as of Dec 81

TWO YEAR AVERAGE MTBM (TYPE 1) FOR A-7D ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 45 CAH QPA: 1 MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	39,977	2665	15								
JAN - JUN 81	40,717	2262	18								
JUL - DEC 80	46,574	3327	14								
JAN - JUN 80	46,191	2100	22								
TOTALS	173,459		69								
TWO YEAR AVG. MTBMs		2,514									

(about 360 aircraft, as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR A-10 ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 13 DEC QPA: 2 Emer Brake MTBM	FAIL.	WUC: 13GBC QPA: 1 Emer L.G Ext MTBM	FAIL.	WUC: 45ACT QPA: 1 Left Hand HYD SYS MTBM	FAIL.	WUC: 45BCT QPA: 1 Right Hand HYD SYS MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	93642	4459	42	15607	6	10405	9	10405	9	____	____
JAN - JUN 81	81533	4530	36	9060	9	8154	10	5824	14	____	____
JUL - DEC 80	70555	8819	16	23518	3	23518	3	10079	7	____	____
JAN - JUN 80	58514	5573	21	19505	3	4501	13	9752	6	____	____
TOTALS	304244		115		21		35		36		____
TWO YEAR AVG. MTBMs		5291		14488		8693		8451		____	

(About 500 ACFT As of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR B-52 G ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 13EEG QPA: 4 BRAKES MTBM	FAIL.	WUC: 14FGC QPA: 2 RUDDER, ELEV. MTBM	FAIL.	WUC: 14F6J QPA: 2 MTBM	FAIL.	WUC: 45CBX QPA: 2 OUTBD WING HYD MTBM	FAIL.	WUC: 46GCJ QPA: 1 AIR REFUEL MTBM	FAIL.
JUL - DEC 81	32,275	6456	20	8070	8		0	5869	11	6456	5
JAN - JUN 81	32,844	18770	7	4380	15		0	4492	15	1825	18
JUL - DEC 80	31,724	7050	18	9064	7	63948	1	3966	16	5287	6
JAN - JUN 80	32,273	3485	37	4605	14			4605	14	4030	8
TOTALS	129,116		82		44		1		56		37
TWO YEAR AVG. MTBMs		6,298		5868		129,116		4,611		3489	

(about 170 aircraft)
as of Dec 81

TWO YEAR AVERAGE MTBM (TYPE 1) FOR B-52H ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 13EEC QPA: 4 BRAKES MTBM	FAIL.	WUC: 14FGG QPA: 2 RUDDER, ELEV. MTBM	FAIL.	WUC: 45CBX QPA: 2 OUT BD. WING HYD MTBM	FAIL.	WUC: 46GCJ QPA: 1 AIR REFUEL. MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	19,235	12,825	6	6413	6	12825	3	3206	6	____	____
JAN - JUN 81	19,628	3739	21	5609	7	4908	8	9816	2	____	____
JUL - DEC 80	18,264	6641	11	6088	6	7306	5	3653	5	____	____
JAN - JUN 80	18,316	4579	16	1928	19	4579	8	6105	3	____	____
TOTALS	75,443		54		38		24		16		____
TWO YEAR AVG. MTBMs		5,588		3,970		6286		4715		____	

(about 94 aircraft, as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR C-5A ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 11 LCH QPA: 1 CREW DR. MTBM	FAIL.	WUC: 13 AON QPA: 3 ALG DR, EMER UNLK MTBM	FAIL.	WUC: 13 BDS QPA: 1 NLG DR EMER UNLK MTBM	FAIL.	WUC: 13 ECV QPA: 1 MTBM	FAIL.	WUC: 13 FCU QPA: 1 NLG STEER. MTBM	FAIL.
JUL - DEC 81	29,165	7292	4	12,500	7	29167	1	3241	9	14584	2
JAN - JUN 81	24,306	3473	7	10,413	7		0	6077	4	12154	2
JUL - DEC 80	26,480	4413	6		0		0	8827	3		0
JAN - JUN 80	25,102	12551	2	8367	9		0	1794	14	12551	2
TOTALS	105,053		19		23		1		30		6
TWO YEAR AVG. MTBMs		5,529		13,702		105,053		3502		17,509	

(about 76 aircraft, as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR C-5A ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 45LAH QPA: 1 HYD SYS NO 1 MTBM	FAIL.	WUC: 45LCH QPA: 1 HYD SYS NO 1 MTBM	FAIL.	WUC: 45LER QPA: 1 RAT EMER SYS MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	29,165	29167	1	____	0	____	0	____	____	____	____
JAN - JUN 81	24,306	4862	5	24306	1	24308	1	____	____	____	____
JUL - DEC 80	26,480	____	0	13240	2	____	0	____	____	____	____
JAN - JUN 80	25,102	8367	3	5020	5	25102	1	____	____	____	____
TOTALS	105,053		9		8		2		____		____
TWO YEAR AVG. MTBMs		11,672		13,131		52,527		____		____	

TWO YEAR AVERAGE MTBM (TYPE 1) FOR C-141 ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 14ECK QPA: 1 Elevator Control MTBM	FAIL.	WUC: 24FAE QPA: 1 Aux Power Plant MTBM	FAIL.	WUC: 45C00 QPA: 1 Hyd Sys #3 MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	146631	15641	9	43990	3	2444	60	____	____	____	____
JAN - JUN 81	138725	11687	12	27755	5	3331	42	____	____	____	____
JUL - DEC 80	143653	11492	13	21548	7	2972	48	____	____	____	____
JAN - JUN 80	142728	25374	6	8564	17	2953	48	____	____	____	____
TOTALS	571782		40		32		198		____		____
TWO YEAR AVG. MTBMs		14295		18095		2888		____		____	

(About 250 Ac Ft
As of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR C-130 ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 1320 QPA: 2 Brake MTBM	FAIL.	WUC: 454AA QPA: 1 Utility Hyd Sys MTBM	FAIL.	WUC: 457AB QPA: 1 Booster Hyd Sys MTBM	FAIL.	WUC: 454AC QPA: 1 Emergency MTBM	FAIL.	WUC: 454AD QPA: 1 Aux Hyd Sys MTBM	FAIL.
JUL - DEC 81	24683	3394	14	3333	7	3703	7	11109	2	____	0
JAN - JUN 81	25698	3534	15	1446	18	2313	11	6939	4	____	?
JUL - DEC 80	24629	2580	19	1956	13	4156	6	4750	5	____	0
JAN - JUN 80	24250	3557	14	1819	13	2186	11	8184	3	____	0
TOTALS	99260		62		51		35		14		___
TWO YEAR AVG. MTBMs		3202		1946		2836		7090		Very High	

(About 125 ACFT as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR C-130 B ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 1342 D QPA: 2 Brake MTBM	FAIL.	WUC: 454 AA QPA: 1 Utility Hyd. Sys MTBM	FAIL.	WUC: 454 AB QPA: 1 Booster Hyd. Sys MTBM	FAIL.	WUC: 454 AC QPA: 1 Emer. Hyd Sys MTBM	FAIL.	WUC: 454 AD QPA: 1 Aux Hyd Sys MTBM	FAIL.
JUL - DEC 81	25563	489	104	1643	16	2301	11	4314	6	2301	11
JAN - JUN 81	23695	1580	30	1230	19	1882	13	4570	5	3999	6
JUL - DEC 80	24987	2893	17	1687	15	2811	9	4819	5	3067	8
JAN - JUN 80	25264	1853	27	2006	13	3101	8	11369	2	3411	7
TOTALS	99,509		178		63		41		18		32
TWO YEAR AVG. MTBMs		1112		1580		2427		5528		3109	

About 110 Acft
As of 31 DEC 81

TWO YEAR AVERAGE MTBM (TYPE 1) FOR C-130E ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 1342D QPA: 2 Brakes MTBM	FAIL.	WUC: 454AA QPA: 1 UTILITY MTBM	FAIL.	WUC: 454AB QPA: 1 Booster Hyd Sys MTBM	FAIL.	WUC: 454AC QPA: 1 Emergency Hyd Sys MTBM	FAIL.	WUC: 454AD QPA: 1 Aux Hyd Sys MTBM	FAIL.
JUL - DEC 81	111,725	4280	55	2352	50	5628	21	6851	17	3940	30
JAN - JUN 81	121,234	2447	99	1589	76	5644	22	5845	21	4546	27
JUL - DEC 80	115,918	4554	51	2371	49	3912	30	7113	16	3557	33
JAN - JUN 80	120,055	4890	49	2282	53	6233	20	9003	13	3769	32
TOTALS	473,932		254		228		93		67		122
TWO YEAR AVG. MTBMs		3731		2079		5096		7074		3885	

(About 375 ACFT As of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR C-130B ACCUMULATORS (Drone Retrieval System)

TIME PERIOD	TOTAL OPER HOURS	WUC: 17BDW QPA: 1 Aerial Rec Sys Winch MTBM	FAIL.	WUC: 17HHM QPA: 1 Aerial Rec Cable Assy MTBM	FAIL.	WUC: 17LAB QPA: 1 ATM H/D Recovery MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	2143	____	0	1075	2	____	0	____	____	____	____
JAN - JUN 81	2235	1127	2	564	4	282	8	____	____	____	____
JUL - DEC 80	2149	537	4	1075	2	1075	2	____	____	____	____
JAN - JUN 80	2166	____	0	271	8	____	0	____	____	____	____
TOTALS	8693		6		16		10		____		____
TWO YEAR AVG. MTBMs		1448		543		869		____		____	

(About 9 ACFT as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR F-111A ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 45AAK QPA: 2 BK/DUCE MTBM	FAIL.	WUC: 45AAL QPA: 2 DAMPER SERVO MTBM	FAIL.	WUC: 45AAM QPA: 4 HORIZ STAB MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	9172	9173	2	9173	2	2158	17				
JAN - JUN 81	9059	2589	8	1510	12	755	48				
JUL - DEC 80	9202	18,404	1	4601	4	3346	11				
JAN - JUN 80	9381	1,876	10	3127	6	1975	19				
TOTALS			21		24		95				
TWO YEAR AVG. MTBMs		3506		3068		1550					

(about 85 aircraft as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR F-111D ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 45AAK QPA: 2 BRAKE MTBM	FAIL.	WUC: 45AAL QPA: 2 MANIFOLD SERVO MTBM	FAIL.	WUC: 45AAM QPA: 4 HORIZ. STAB. MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	8558	1903	9	451	38	951	36				
JAN - JUN 81	9155	6105	3	555	33	1145	32				
JUL - DEC 80	8092	4046	4	1079	15	1904	17				
JAN - JUN 80	8775	8775	2	8775	2	5850	6				
TOTALS	34580		18		88		91				
TWO YEAR AVG. MTBMs		3842		786		1,520					

(about 82 aircraft, as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR F-111E ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 45AAK QPA: 2 BRAKE MTBM	FAIL.	WUC: 45AAL QPA: 2 DAMPER SERVO MTBM	FAIL.	WUC: 45AAM QPA: 4 HORIZ STAB MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	10,564	10,567	2	5283	4	4227	10	____	____	____	____
JAN - JUN 81	9,144	____	0	1663	11	1355	27	____	____	____	____
JUL - DEC 80	9,801	19602	1	1634	12	1782	22	____	____	____	____
JAN - JUN 80	9,192	18264	1	____	0	5218	7	____	____	____	____
TOTALS	38540		4		27		66		____		____
TWO YEAR AVG. MTBMs		19,270		2855		2,336		____		____	

(about 70 aircraft, as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR F-111 F ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 45AAK QPA: 2 BRAKE MTBM	FAIL.	WUC: 45AAL QPA: 2 DAMPER SERVO MTBM	FAIL.	WUC: 45AAM QPA: 4 HORIZ. STAB MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	11,419	4,568	5	5710	4	2175	20	____	____	____	____
JAN - JUN 81	11,172	11,175	2	3725	6	2980	16	____	____	____	____
JUL - DEC 80	8440	16,880	1	8440	2	11,253	3	____	____	____	____
JAN - JUN 80	10,053	10,053	2	5027	4	5745	7	____	____	____	____
TOTALS	41,048		10		16		46		____		____
TWO YEAR AVG. MTBMs		8217		5136		3573		____		____	

(about 93 aircraft)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR F-111 (B)A ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 45AAK QPA: 2 BRAKE MTBM	FAIL.	WUC: 45AAL QPA: 2 DAMPER SERVO MTBM	FAIL.	WUC: 45AAM QPA: 4 HORIZ. STAB MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	8,222	4113	4	5484	3	3656	9	____	____	____	____
JAN - JUN 81	8,714	17435	1	1453	12	918	38	____	____	____	____
JUL - DEC 80	8,398	2399	7	2399	7	1200	28	____	____	____	____
JAN - JUN 80	9,013	9013	2	1127	16	2575	14	____	____	____	____
TOTALS	34,347		14		38		89		____		____
TWO YEAR AVG. MTBMs		4907		1808		1,544		____		____	

(about 60 aircraft, as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR F-15 ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 12CBD QPA: 1 Acc. Hyd. Canopy MTBM	FAIL.	WUC: 24 DAD QPA: 2 Acc, Hyd Jet Fuel Start. MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	40839	3403	12	2042	40						
JAN - JUN 81	43353	3097	14	1008	86						
JUL - DEC 80	39899	2347	17	1078	74						
JAN - JUN 80	43635	2297	19	1455	60						
TOTALS	167,726		62		260						
TWO YEAR AVG. MTBMs		2705		1290							

(about 380 Aircraft as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR F-4C ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 1342E QPA: 1 Brakes MTBM	FAIL.	WUC: 4511E QPA: 1 Acc Sys MTBM	FAIL.	WUC: 4512C QPA: 1 Acc Sys MTBM	FAIL.	WUC: 4513D QPA: 1 Utility MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	22572	7525	3	____	0	____	0	____	0	____	____
JAN - JUN 81	23151	3859	6	____	0	____	0	____	0	____	____
JUL - DEC 80	23058	1922	12	____	0	____	0	____	0	____	____
JAN - JUN 80	23687	1974	12	____	0	____	0	____	0	____	____
TOTALS	92468		33		0		0		0		____
TWO YEAR AVG. MTBMs		2802		∞		∞		∞		____	

(About 290 ACFT as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR F-4D ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 1342E QPA: 1 Brakes MTBM	FAIL.	WUC: 4511E QPA: 1 Ac Sys MTBM	FAIL.	WUC: 4512C QPA: 1 Ac Sys MTBM	FAIL.	WUC: 4513D QPA: 1 Utility MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	42793	2140	20	____	0	____	0	____	0	____	____
JAN - JUN 81	44389	1233	36	____	0	14797	3	44391	1	____	____
JUL - DEC 80	46013	2556	18	____	0	15338	3	____	0	____	____
JAN - JUN 80	45183	1369	33	15061	3	9037	5	____	0	____	____
TOTALS	178378		107		3		11		1		____
TWO YEAR AVG. MTBMs		1667		59459		16216		178378		____	

(About 430 aircraft as of 31 Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR F-4E ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 1342E QPA: 1 Brakes MTBM	FAIL.	WUC: 4511E QPA: 1 Acc Sys MTBM	FAIL.	WUC: 4512C QPA: 1 Acc Sys MTBM	FAIL.	WUC: 4513D QPA: 1 Utility MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	56005	2240	25	____	0	____	0	____	0	____	____
JAN - JUN 81	57185	1546	37	19062	3	11437	5	____	0	____	____
JUL - DEC 80	55941	1598	35	____	0	18647	3	27971	2	____	____
JAN - JUN 80	67407	1465	46	67407	1	8426	8	22469	3	____	____
TOTALS	236538		143		4		16		5		____
TWO YEAR AVG. MTBMs		1654		59135		14784		42308		____	

(About 510 ACFT)
As of 31 Dec 81

TWO YEAR AVERAGE MTBM (TYPE 1) FOR RF-4C ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 1342 E QPA: 1 Bearer MTBM	FAIL.	WUC: 4511 E QPA: 1 Acc Sys MTBM	FAIL.	WUC: 4512 C QPA: 1 Acc Sys MTBM	FAIL.	WUC: 4513 D QPA: 1 Utilizn MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	41067	1580	26	____	0	____	0	____	0	____	____
JAN - JUN 81	39972	1428	28	____	0	13324	3	____	0	____	____
JUL - DEC 80	38268	1664	23	____	0	19134	2	____	0	____	____
JAN - JUN 80	39679	1167	34	39679	1	13226	3	____	0	____	____
TOTALS	158986		111		1		8		0		____
TWO YEAR AVG. MTBMs		1432		158986		19873		Very High		____	

(About 330 ACFT
As of 31 Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR F-16B ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 45AAC QPA: 2 FLT Control MTBM	FAIL.	WUC: 45AAD QPA: 2 Ras Sig MTBM	FAIL.	WUC: 45AAE QPA: 2 BRAKE + JFS MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	6875	1375	10	13754	1	6877	2	____	____	____	____
JAN - JUN 81	7944	1445	11	15890	1	5297	3	____	____	____	____
JUL - DEC 80	5033	1438	7	2517	4	2013	5	____	____	____	____
JAN - JUN 80	4004	1144	7	4004	2	2002	2	____	____	____	____
TOTALS	23856		35		8		12		____		____
TWO YEAR AVG. MTBMs		1363		5964		3976		____		____	

(About 60 ACFT as of Dec 81)

TWO YEAR AVERAGE MTBM (TYPE 1) FOR F-16A ACCUMULATORS

TIME PERIOD	TOTAL OPER HOURS	WUC: 45AAC QPA: 2 Flt Control MTBM	FAIL.	WUC: 45AAD QPA: 2 Rec Sys MTBM	FAIL.	WUC: 45AAE QPA: 2 BRAKE + JFS MTBM	FAIL.	WUC: 45AAF QPA: 1 Decel Para MTBM	FAIL.	WUC: ____ QPA: ____ MTBM	FAIL.
JUL - DEC 81	23590	1966	24	11795	4	2359	20	____	0	____	____
JAN - JUN 81	23009	920	50	7670	6	1354	34	____	0	____	____
JUL - DEC 80	11122	927	24	5561	4	2224	10	____	0	____	____
JAN - JUN 80	6240	1248	10	2080	6	2080	6	____	0	____	____
TOTALS	63961		108		20		70		0		____
TWO YEAR AVG. MTBMs		1184		6396		1827		VERY HIGH		____	

(ABOUT 210 ACFT)
as of Dec 81

APPENDIX C

Q-D056B-B05 AND

B06 SUMMARIES

Published By:

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PCN: Q-D056B-B06-RX-254

18 NOV [illegible]

RCS: LOG-LOE(AR)7170
(Report B06)

FOREWORD

TITLE: Maintenance Actions, Man-Hours, and Aborts by Work Unit Code.

SOURCE: AFM 66-1, TO 00-20-2 Series, "On" and "Off" equipment work reported on AFTO Form 349 and AFR 65-110 aircraft utilization data.

FREQUENCY: Monthly (or less frequently at the option of the System Manager Air Logistics Center - reference AFLCR 66-15).

CONTENTS: This report provides "On" and "Off" equipment historical information on the maintenance actions, man-hours, and aborts for the past six months, by month, on every work unit code (WUC) included in the master record. This report also provides a series of summary line entries for each system and subsystem in WUC sequence, and EAD and system summaries at the end of the report. Due to the method of assigning and reporting standard reporting designators (SRD) for registered support equipment, "Off" equipment data cannot be displayed for this equipment. All of the data columns displayed in this report, unless otherwise noted in the column header, relate to and result from "On" equipment maintenance actions.

USE: This report is used as a reference for historical information pertaining to each assigned WUC. It provides the capability to plot trending and performance data in the areas of failures, maintenance actions, manpower resource expenditures, and aborts. Monthly it can be used to monitor problem areas and to verify the effectiveness of modifications. Current and previous years' microfiche reports are available for special studies.

DESCRIPTION:

1. Responsible Air Logistics Management Organization and End Article Identification. In the upper left-hand corner of the report the System Manager-Air Logistics Center (ALC) is printed, along with the equipment type designator and end article designtor (EAD). The EAD is structured by equipment type in accordance with AFLCR 66-15, Chapter 2, as follows:

a. For aircraft and related mobile training sets - Modified mission symbol (if assigned), basic mission and type symbol, design number and series (if a master record is established by series) - for example: F015, B052H, F111T, and T038T.

b. For air launched missiles (ALM) or ground launched missiles (GLM) - The launch environment symbol, mission and type symbol, design number and series (if a master record is established by series) - for example: AIM009E, GLM030B.

c. For ground communications-electronic (C-E), except L systems - The installation, equipment and purpose designation; the design number and series (if a master record is established by series) - for example: TPN019V, TRC197.

d. For ground communications L systems (C-E) - The system identifier "L" and the standard reporting designator - for example: 407L8K1.

e. For registered support equipment (SE) - The Federal Supply Class and NIIN designator portion of the registration number - for example: 6115AWA.

f. For support equipment (SE) which is identified by a standard reporting designator - The type model and the series (if a master record is established by series) - for example: GSM231.

g. For trainers and simulators (TRS) - The second and third characters of the standard reporting designator, the first two characters of the end item work unit code and three zeros - for example: RADF000.

h. For ground launched missile (Class 1) trainers (TRS) - The type, model, and series and "T" - for example: LGM030T.

i. For aircraft engines (ENG) - The basic engine type and model and the last two characters of the standard reporting designator of the aircraft in which the engine is installed - for example: TF033BP.

j. For munitions (WEP) - A "W," a blank, the first three characters of the end item work unit code and two zeros - for example: W RSV00.

2. Demand Report Control Number: When the report is produced by demand, this is the control number entered in columns 19-24 of the demand request card. See AFLCR 66-15, Chapter 6, for its purpose and structure.

3. Period Ending: This is the last day of the report month. The month indicates the most current effective period of the data in this report.

4. WUC: This is a listing of work unit codes which qualify for entry in this report as described in "CONTENTS" paragraph.

5. NOUN: This is the noun describing the work unit code.

6. Cat, QPA, ACT LMT or FAIL LMT and USE FACT. These entries, from the B4 Master Record, appear immediately below the WUC and Noun. Following is a descripton of each entry:

a. Cat Ind: This is a category indicator placed in the B4 Master Record by the system manager to identify the relationship of the WUC to the safety/mission accomplishment of the end article:

Category Indicator	Description
A	Safety of Flight/Operation. This identifies work unit codes, which upon failure or malfunction, would present a safety hazard to the end piece of equipment or operating personnel.
B	Mission Accomplishment. This identifies work unit codes which, upon failure or malfunction, would adversely affect mission accomplishment.
C	General Logistics. This identifies work unit codes, not assigned Category A or B, which will be evaluated from a hi-value, reliability, critical support and normal performance standpoint.

b. QPA - This is the quantity per application of the work unit code to the end piece of equipment.

c. ACT LMT - If this header appears, the entry is Action Limit. This value is a computed or manually assigned value based on accumulated experience, or estimated when an adequate experience base is not available. The criteria for establishing or adjusting this value is prescribed in AFLCR 66-15, Chapter 2, Section B. Action Limit applies only to aircraft, aircraft engines, and the AGM069A. If the work unit code experience reflects a low or erratic failure rate there probably will be no Action Limit assigned and the entry will be NO LMT.

d. FAIL LMT - If this header appears, the entry is Failure Limit. This value is manually assigned by the system/item manager ALC and represents an acceptable and expected count of reported failure conditions reported for one month. The criteria for establishing or adjusting this value is prescribed in AFLCR 66-15, Chaper 2, Section B. Failure Limit applies to all equipment not covered by Action Limit (paragraph c above). As in paragraph c above a NO LMT entry denotes a low or erratic failure rate and the equipment manager has not assigned a limit to this item.

7. USE FACT. This is Use Factor (K1), the ratio of work unit code item operation to the end item operation.

8. Month - This is a listing of the current month and each of the preceding five months on which maintenance actions have been reported, or for which a Mean Time Between Maintenance Type 1 (MTBM-1) has been computed. An asterisk (*) after the month indicates that the Action Limit or Failure Limit has been breeched for the month. For equipment where Action Limit applies, this indicator will appear when the MTBM-1 has been calculated at less than the Action Limit. For equipment where Failure Limit applies, this indicator will appear when the failure count for one month equals or exceeds the Failure Limit. When any of the previous five months do not appear in this column, no maintenance actions or man-hours were processed for the WUC during those months.

9. Inv - This is the inventory of the End Article or WUC and it is furnished for information only. Inventory is entered under the following criteria:

a. Computed Inventory - This is the average possessed inventory - as computed from the Aerospace Vehicle Inventory, Status and Utilization Reporting System (AFR 65-110) - for aircraft, AQM, BQM, CQM, and PQM drones and the AGM069A missile. For aircraft engines, the average possessed inventory for the aircraft is multiplied by the number of engines on the aircraft.

b. Special Inventory - A manual special inventory as entered in the B4 Master Record will appear when the inventory of the WUC applies to only a part of the fleet or as stated in paragraph c below. Special inventory for airborne equipment is used to prorate operating time registered for the entire fleet (fleet inventory will be used if the special inventory is greater). Special inventory is identified by an "X" immediately to the right of this column.

c. Inventory for all equipment other than those categories indicated in paragraph 9a above is the inventory manually entered in the B4 Master Record by the equipment manager. The inventory for equipment other than aircraft and engines is used to compute the operating time which appears in the operating time column of this report.

10. Op Time - This column displays the total fleet time that the end article was operated for each month listed, or a computed figure, and a six month total line for each WUC.

a. For aircraft and the AGM069A monthly line entries on all numeric system WUCs, the operating time will be: flying time X inventory ratio.

NOTE: Inventory ratio is B4 special inventory (if a special inventory has been entered) divided by AFR 65-110 inventory.

b. For aircraft engine reports, the monthly line entries will be: aircraft flying time X the number of installed engines X inventory ratio.

c. For ground and air launched missiles, the monthly line entries will be: AFR 65-110 inventory (if available) X 30 days X inventory ratio; or B4 inventory X 30 days (if AFR 65-110 inventory is not available).

d. For all other equipment plus alpha system WUCs in missile master records, the monthly line entries will be: B4 inventory X 30 days.

e. For the six months total line entries, the operating time will conform to the following criteria:

(1) When six months of maintenance data is displayed for a WUC, the six month line entry is a total of the six months operating time.

(2) When less than six months of maintenance data is displayed for a WUC, but the WUC has reported actions which pre-date the current six month period, the six month line entry is a total of the six months operating time.

(3) When less than six months of maintenance data is available for the WUC, the six month line entry is the total operating time from the first month that the work unit code was added to the B4 Master Record.

11. Abo - This is the number of aborts (mission failures) reported for the work unit code for the months indicated. On equipment maintenance actions with a when discovered code/ equipment type combinations are counted as aborts. (Records with zero units and those with invalid or no defect low malfunction codes are excluded.)

a. For ACF, ALM and ENG (Aircraft/Mobile Training Sets, Air Launched Missiles and Aircraft Engines). When Discovered Codes "A" or "C" in combination with Action Taken Codes "F, G, K, L, P, R, or Z."

b. For GLM (Ground Launched Missiles). When Discovered Codes "A, C, H, or P" in combination with Action Taken Codes "F, G, K, L, P, R, or Z."

c. For SE, TRS, and C-E (Support Equipment, Trainers, Simulators, Missile Class 1 Trainers, Ground Communications-Electronic Equipment and L Systems). When Discovered Code "C" in combination with Action Taken Codes "F, G, K, L, P, R, or Z."

d. For WEP (Munitions). When Discovered Code "C" in combination with Action Taken Codes "F, G, K, L, P, R, or Z."

12. Maint Actions - This is the number of maintenance actions reported for the current month and each of the preceding five months against the listed work unit code. The accumulation is based on a count of units completed on maintenance actions with selected how mal and action taken combinations. These actions are determined and listed as follows:

a. Type-1 - This column displays failures. The computer definition of a failure at the two, three, and five position work unit code level is:

(1) Any Type 1 how malfunction code in combination with an action taken code of F, K, L, or Z.

(2) Any Type 1 how malfunction code in combination with an action taken code of P or R provided the removed item was not found serviceable ("B" action taken code) at the bench check station.

b. Type-2 - This column displays other malfunction actions which are defined as:

Type 2 how malfunction code and all action taken codes listed in paragraph 11b above.

c. Total - These are the total maintenance actions (units) reported under all valid how malfunction codes (Types 1, 2, and 6) and all action taken codes listed in paragraph 11b above, plus E, H, J, S, V, and X.

13. MTBM - This is the Mean Time Between Maintenance Type 1 or Mean Time Between Maintenance Total as indicated by the following two subheadings:

a. Type 1 - The Mean Time Between Maintenance Type 1 (MTBM-1) is computed each month for each work unit code unless no failures have been reported for any three consecutive months within time span covered by this report. For each monthly MTBM-1 computation, a three month accumulation of failures and operating time (flying hours or days) is used, i.e., current and previous two months. Following is the formula:

$$\text{MTBM-1} = \frac{\text{Operating Time X Use Factor X QPA}}{\text{Quantity of Failures}} \text{ X Inventory Ratio}$$

Where:

Operating Time	= A three month (current and previous two months) accumulation of flying hours. Adjusted by inventory ratio, or inventory X days, as applicable. (See paragraph 10.)
Use Factor	= Ratio of item operating time to flying hours. (Normally 1.00)
QPA	= Number of identical items reportable under one work unit code.
Quantity of Failures	= A three month (current and previous two months) accumulation of failures.
Inventory Ratio	= B4 special inventory divided by AFR 65-110 inventory.

b. Total - The Mean Time Between Maintenance total is computed each month for each work unit code using the same formula and criteria as for MTBM-1 with one exception, i.e., quantity of total maintenance actions is substituted for quantity of failures. See paragraph 12c.

14. Man-hours - This is the number of man-hours (whole labor hours) reported on the work unit code for the months listed. These man-hours are listed as follows:

a. Sched - These are the man-hours spent as schedule maintenance and reported by the following Type Maintenance Codes as listed in AFM 300-4, ADE MA-358.

(1) For aircraft (including installed engines), drones, and related mobile training sets and resident training equipment: "A, C, D, E, H, J, M, P, Q, R, T."

(2) For engine shop work: "A, C, D, H, K, Q, T."

(3) For Air Launched Missiles, related Support and Training Equipment: "A, C, D, E, J, P, R, T."

(4) For Ground Launched Missiles, related Support, Communications-Electronic and Training Equipment: "A, D, F, J, P, R, T."

(5) For Common Support Equipment: "A, D, J, P, Q, R, T."

(6) For Class 1 Trainers: "A, D, J, P, R, T."

(7) For Ground Communications-Electronic Equipment: "A, F, J, P, R, T."

(8) For Munitions: "A, J, R, T."

b. Unsch - These are the man-hours spent as unscheduled maintenance and reported by the following Type Maintenance Codes as listed in AFM 300-4, ADE MA-358. For all of the categories of equipment listed in paragraph 14a above, the following codes, as they apply, are considered to be unscheduled maintenance: "B, E, H, L, S, W, Y."

*NOTE - These codes can be scheduled maintenance - see preceding paragraphs (1), (2), and (3) for description by equipment type.

c. Shop - These are the man-hours expended by shop maintenance personnel in checking/repairing items removed from the end article which are charged to this Work Unit Code. These are "Off" equipment man-hours and include Programmed Depot Maintenance (PDM) but exclude depot component overhaul.

15. Shop Action Units - This is a unit count of "Off" equipment actions reported on the Work Unit Code. The following three categories of shop actions are identified:

a. Repr - This column is a unit count of "Off" equipment actions which have been assigned Action Taken Codes A, F, G, K, L, V, or Z.

b. Condm - This column is a unit count of "Off" equipment actions which have been assigned Action Taken Code 9.

c. NRTS - This column is a unit count of "Off" equipment actions which have been assigned Action Taken Codes 1 through 8.

NOTE: The above columns include Programmed Depot Maintenance (PDM) but exclude depot component overhaul.

16. Totals - Below the month entries for each WUC, totals are listed for each of headings (paragraphs 9-14). The mean time calculations are based on six month totals of units and operating time.

17. Subsystem Summary - After all WUCs for a subsystem are listed, data is summarized for the subsystem (the first three characters of the work unit code suffixed with "XX") for the current month, each of the preceding five months, and a subsystem total. This summary is not produced if only one WUC is reported for the system.

18. System Summary - After all WUCs and subsystems for a system are listed, data is summarized for the system (the first two characters of the work unit code suffixed with "XXX"), in the same format as the subsystem summary above.

19. EAD Summary - After the last system summary for each EAD, a new page will start with an EAD Summary. It summarizes all data included in system and subsystem summaries. Computations using B4 data fields will substitute 001 for QPA and 01.00 for Use Factor. Operating time will be "fleet," or will be computed from the first B4 inventory, as applicable.

20. System Summary - System summaries will be repeated in this section for easy reference.

21. The End Article Designator (EAD) in the upper left-hand corner of each page of this report may represent a single item of equipment or a group of similar end items, as determined by the System Manager ALC. For aircraft and missiles, all Mission Design Series (MDS) for which data may appear in the report are listed under heading - "Data for the Following Weapon Systems can be in this report:," at the end of the report.

COMMENTS: All comments regarding the contents, use, and distribution of this report should be submitted through command channels to HQ AFLC/LOEP, Wright-Patterson AFB, Ohio 45433.

ALC: APALC TYP EQP: ACF EAC: C007A WUC: 12313

WUC / WORK UNIT CODE	MONTH	INV	CP TIME	ARC	PAINT ACTION FAIL	PAINT ACTION OTH/MAL	PAINT ACTION TOT	ITEM TYPE-1	ITEM TOTAL	MANHOURS SCHED	MANHOURS UNSCH	SHOP	SHOP ACTION REPR	SHOP ACTION CONDN	UNITS-NRTS
12313 SAFETY BELT	SEP	35	891												
CAT CPA ACT LMT USE FACT	JUL	30	842					13852	13852						
C 32 1.00	JUN	30	837					12861	12861						
	MAY	30	747		6		6	12892	12892		1				
	TOTALS		5130		6		6	27420	27420		1				
12314 ATTACHMENT FAIL	SEP	35	891						9460						
CAT CPA ACT LMT USE FACT	AUG	29	935			2	2		5351	3					
C 4 1.00	JUL	30	842						9789						
	JUN	30	837						9646						
	MAY	30	747			1	1		9919						
	TOTALS		5130			3	3		6059	3					
123XX TROOP SEATS	SEP	35	891		4	3	7	8735	1506	6					
CAT CPA ACT LMT USE FACT	AUG	29	935		1	9	10	21403	1861	12					
B 16 1.00	JUL	30	842			12	12	3012	1450	7					
	JUN	30	837		1		1	2143	1929		4				
	MAY	30	747		12	2	14	2240	1984		12				
	APR	30	836		5		5	6328	2531	2					
	TOTALS		5130		23	26	49	3576	1679	27	16				
12XXX FUSELAGE COMP GEN	SEP	35	891		6	44	57	218	12	44	16	20	1		
CAT CPA ACT LMT USE FACT	AUG	29	935		5	186	186	297	13	203	27	48	5	1	
C 1 1.00	JUL	30	842		2	44	47	87	17	81	27	16	2		
	JUN	30	837		2	22	36	49	14	9	42	4	1		
	MAY	30	747		24	32	59	48	12	61	33	82	10		
	APR	30	826		23	54	81	72	14	171	95	55	11		
	TOTALS		5130		62	382	396	83	13	569	240	225	30	1	
12000 LANDING GEAR	SEP	35	891												
CAT CPA ACT LMT USE FACT	AUG	29	935								4				
B 3 1.00	JUL	30	842								21				
	JUN	30	837								4				
	MAY	30	747								26				
	APR	30	826						7119		28				
	TOTALS		5130								83				
120XX SUBSYSTEM SUMMARY	SEP	35	891												
CAT CPA ACT LMT USE FACT	AUG	29	935								4				
1 1.00	JUL	30	842								21				
	JUN	30	837								4				
	MAY	30	747								26				
	APR	30	826						8373		28				
	TOTALS		5130								83				
13100 MAIN GEAR ASSY	SEP	35	891			1	1	2730	1092	24	5				
CAT CPA ACT LMT USE FACT	AUG	29	935					2476	1078	105	7				
B 2 1.00	JUL	30	842		3		4	2468	979	67	28				
	JUN	30	837				1		2412	48	5				
	MAY	30	747						4759		7				
	APR	30	826			1	1		2373	1	7				
	TOTALS		5130		3	2	7	5141	1489	248	41				

PCN: Q-D056B-B05-RX-217 (Microfiche - Monthly)
Q-D056B-B05-WK-M17 (Paper - Weekly, AR)

18 NOV 1981

RCS: LOG-LOE(AR)7169
(Report B05)

FOREWORD

TITLE: Summarized Maintenance Actions for Selected Work Unit Codes.

SOURCE: TO 00-20-2 Series, "ON" and OFF" Equipment Work Reported on AFTO Form 349.

IDENTIFICATION: Consists of responsible ALC for logistics management, report control number (demand only), type equipment, End Article Designator (EAD), and Work Unit Code (WUC). Listed at the end of this report is the various mission, design, and series (MDS) of weapon systems included in this report.

FREQUENCY:

a. Monthly (or less frequently at the option of the System Manager of the Air Logistic Center (Ref AFLCR 66-15). This report is produced when one of the following conditions exist.

(1) When the number of failures equals or exceeds the established failure limit for a work unit code for the current month. Failure limit applies to all categories of equipment except aircraft, aircraft engines and the AGM069A.

(2) When the Mean Time Between Maintenance - Type 1 (MTBM-1) computation is less than the action limit (AL) established for two consecutive months. The monthly MTBM-1 computation is based on the current and two previous months accumulation of MTBM-1 actions divided into the corresponding three months operating time. Action limit applies only to WUCs for aircraft, aircraft engines, and numeric WUCs for the AGM069A.

b. On Demand (Special Request). This report can be produced when requested for an entire EAD, system (2 digit WUC), subsystem (3 digit WUC), or WUC (5 digit WUC). Reference AFLCR 66-15, Chapter 6, Section B for demand format.

c. Emergency Demand Request. This report can be produced within 24 hours to support accident/incident investigations.

CONTENTS: This report provides six months of summarized detail information on work unit codes which do not perform to the preset standards described above. When this report is produced as a result of a demand request, it will provide from one to twelve months of data at the option of the requester. Support General Data (units and man-hours) is reported by demand only. The three parts of the report are produced for each work unit code. Part I - "ON" equipment actions, Part II - Shop actions (except for SE), and Part III - Parts replaced (except for SE).

USE: This report is used to conduct detail analysis for special studies on work unit codes to:

a. Determine the reasons for substandard performance and monitor problem areas.

b. Assess the impact of changes to inspection requirements.

c. Determine whether or not the maintenance actions are distributed evenly across the inventory or if they are concentrated at specific locations.

d. Verify modifications effectiveness.

e. Identify reasons for items causing a high rate of unscheduled maintenance.

f. [illegible]

DESCRIPTION:

a. Part I. "ON" Equipment Actions.

(1) How Malfunction - Code, Noun and Type. This column displays the numeric how malfunction codes, and the nouns describing the codes, reported against the work unit code. Type how malfunction codes (1, 2, and 6) are described in AFLCR 66-15, Chapter 5, Section B.

(2) Curr MO Unit Count.

(a) Fail. This column displays the number of failures accumulated during the current month for each how malfunction code appearing in the report. (See failure definition in paragraph a(3)(a) below.)

(b) Oth Mal. This column displays the numbers of other malfunctions accumulated during the current month for each how malfunction code appearing in the report. (See Oth Mal definition in paragraph a(3)(b) below.)

(3) Six Month Unit Count. The following columns display the number of units completed accumulated for the most recent six month period when the report is produced as a result of performance not meeting the action limit or failure limit criteria. These columns will contain one to twelve months of data for demand requests, depending on the period of data requested. Column headings will reflect the requested number of months.

(a) Fail. This column displays the number of failures (units) for the WUC. The computer definition describing a failure at the five position work unit code level is:

1. Any Type 1 how malfunction code in combination with an action taken code of F, K, L, or Z.

2. Any Type 1 how malfunction code in combination with an action taken code of P or R, provided the removed item was not found serviceable ("B" action taken code) at the bench check station.

(b) Oth Mal. This column displays other malfunctions (units) which are defined as any Type 2 how mal code with action taken codes F, G, K, L, P, R, or Z or any Type 1 how mal code with action taken code "G."

(c) Six Month Unit Count by Action Taken. The following individual columns display the number of units completed accumulated for each action taken code (or group of action taken codes) listed in the column heading. Six months of data will be in these columns when the report is produced as a result of performance not meeting the action limit or failure limit criteria. For demand request, these columns will contain one to twelve months of data depending on the period of data requested.

(4) Six Month Units. This column displays the number of units accumulated for each how malfunction code listed for the most recent six month period when the report is produced as a result of performance not meeting the action limit or failure limit criteria. Demand requests will contain one to twelve months of data, depending on the period of data requested. Column heading will reflect the number of months.

(5) Six Month M/HRS. This column displays the number of man-hours accumulated for each how malfunction code listed for the most recent six month period when the report is produced as a result of performance not meeting the action limit or failure limit criteria. For demand request, refer to paragraph (4) above.

(6) Total. A total line is entered for each type how malfunction. This is indicated by a single asterisk (*).

(7) WUC Total. The WUC total line is the sum of total lines, described in paragraph (6) above.

(8) Six Month Units & Man-hours for Other Actions. This line print will appear as the last entry in this section of Part I. This entry displays six months units and man-hours on action taken codes other than those listed in paragraph (c) above, plus any unidentified action codes which have been reported. Action taken codes "Q," "T," "U," "Y," and INVL will appear on this entry. For demand request, refer to paragraph (4) above.

(9) The second section of Part I displays the same data as the first section except that the data is in command/base sequence instead of by how malfunction code.

b. Part II. Shop Actions. The heading for this part of the report is the same as Part I. The data within this part, however, is grouped by Federal Supply Class (FSC) and Part Number (P/N) of the item being repaired; along with the National Item Identification Number (NIIN), Materiel Management Code (MMC) if the part number can be successfully matched using the reported FSC/PN and the "OFF" equipment master record. In instances where reported FSC/PN combinations cannot be matched to a NIIN, the part numbers and associated data are grouped and displayed as the last entry in this part. Part II is a two-section display of data for each part number processed as a shop maintenance action and reported against the work unit code indicated. The first section displays data in how malfunction code sequence and the second section in base sequence, with a spread of action taken code groupings across the page of the report. The following headings apply:

(1) How Malfunction, Code, and Noun. (Reference AFM 300-4, Volume I).

(2) Repair, AFG. These columns display the number of units and man-hours reported against the how malfunction code using action taken codes "A," "F," and "G."

(3) Adjust, KL. These columns display the number of units and man-hours reported against the how malfunction code using action taken codes "K" and "L."

(4) CLN/TEST/CRSN, VXZ. These columns display the number of units and man-hours reported against the how malfunction code using action taken codes "V," "X," and "Z."

(5) SRVCBLE, BJ. These columns display the number of units and man-hours reported against the how malfunction code using action taken codes "B" and "J."

(6) NRTS & Condemned. These columns display the number of units processed through field maintenance repair shops, but not returned to a serviceable condition at base level. Also, a composite entry of man-hours to process these items is displayed.

(a) NRTS 1 - Repair not authorized.

(b) NRTS 2-6 - Item not repaired due to lack of equipment, tocls, facilities, skills, parts, shop backlog or technical data.

(c) NRTS 7-8 - Item not repaired, excess to base requirements or directed return to depot.

(d) NRTS 9 - Item is condemned.

(7) Total. These columns display the total number of units and man-hours (paragraph b(1) through b(6)) reported against the how malfunction code.

(8) Delayed, CDMN. These columns display the number of units and man-hours reported against the how malfunction code using action taken codes "C," "D," "M," and "N."

(9) The same spread of data for the part number (described in paragraph b(2) through b(8) above) is displayed in base sequence.

(10) WUC Total. At the end of Part II for each WUC, the totals of columns of paragraph b(2) through b(6) for all part numbers are displayed.

c. Part III, Parts Replaced. The heading for this part of the report is the same as Part I. This part contains data identifying the actual parts replaced during repair. These parts replaced relate to the part numbered items repaired and identified in Part II for the work unit code indicated. Data is displayed by FSC/Part Number as follows:

(1) FSC, Part Number. These columns identify the parts replaced.

(2) How Malfunction, Code and Noun(s). These columns describe the reasons for the parts replacement.

(3) Ref Sym Noun. This column displays the reference symbol used on communication, armament, and electronics equipment. The symbol indicates the position within a circuit in which the replaced part was installed. For other parts replaced, a noun describing the part is listed. The entry is obtained from Block 29d of the AFTO Form 349.

(4) Base. This column contains the name of the base reporting the how malfunction and replacement action.

(5) Quantity, Curr and Five. These columns display the number of units (parts replaced) for the current month and the previous five months when the report is produced as a result of performance not meeting the action limit or failure limit criteria. For demand requests, the previous months column will contain one to eleven months of data depending on the number of months requested.

(6) Total. When more than one line is printed for a part number, a part number total line is printed.

(7) WUC Total. Where more than one line is printed in Part III, a WUC total line is printed.

d. The End Article Designator (EAD) in the upper left-hand corner of each page of this report may represent a single item of equipment or a group of similar end items, as determined by the ALC System Manager. For aircraft and missiles, all Mission Design Series (MDS) for which data may appear in the report are listed under the heading - "Data for the Following Weapon Systems may be in this report:."

COMMENTS: All comments regarding the contents, use, and distribution of this report should be submitted through command channels to HQ AFLC/LOEP, Wright-Patterson AFB, Ohio 45433.

SUMMARIZED MAINTENANCE ACTIONS FOR SELECTED WORK UNIT CODES 81/10/30 C-C056P-P0F-Rx-217 PAGE 49

PERIOD ENDING 81SEP30 RCS: LCC-LCF(AR)7179

ALC:MALC FCN: TYP EQP: ACF EADI C123 WUC: 72117

CNTL SAMPLE SM291 CAT INF C

PART I - ON EQUIPMENT ACTIONS

--FCD MALFUNCTION-- CODE	ACTN	CURR PD UNIT COUNT FAIL	CTHMAL	SIX MONTH UNIT COUNT FAIL	CTHMAL	F REPS	FR REPS	G ATCH	KL ADJ	Z CASA	V CLA	Y TEST	S REP	FHJ OTHER	SIX MONTH UNITS	SIX MONTH M/HRS
TYPE 1																
037	ELECTRATES			1			1								1	1.0
127	ADJUST IMPROP	1		1			2		2						4	2.7
135	STUCK OR JAM			1			1								1	.4
242	FAIL TO OPER				1		2	1							3	2.7
255	NO OUTPUT						7								7	9.1
383	LOOK ON MAL			1			16								16	15.9
472	FUSE BLOWN				1			1							1	.5
721	IMP RE ELE TAPT			1			1								1	7.8
750	MISSING				1			1							1	.9
901	INTERMITTENT			1			1								1	1.1
	TOTAL	1		3	3		31	3	2						36	37.2
TYPE 2																
100	ERRN SAFTY MP		1		1			1							1	.3
	TOTAL		1		1			1							1	.3
TYPE 6																
799	NO DEFECT															.0
	TOTAL															.0
	WLC TOTAL	1	1	33	4		31	4	2						37	37.5

6 MONTHS UNITS & MANHOURS	A/T UNITS	HOURS	A/T UNITS	HOURS	A/T UNITS	HOURS	A/T UNITS	HOURS	A/T UNITS	HOURS	A/T UNITS	HOURS
FOR OTHER ACTIONS	6 27	36.1	1	.0	0	.0	Y	.0	TNVL			.0

COMPANY BASE

AFB KICKAPOO AFB OK		19		19						19	22.7
AFB DISTRIBUTE AFB PAS		14	4	12	4	2				18	14.8
TOTAL		33	4	31	4	2				37	37.5
WLC TOTAL		33	4	31	4	2				37	37.5

SUMMARIZED MAINTENANCE ACTIONS FOR SELECTED WORK UNIT CODES 81/10/30 C-E056P-R05-RX-217 PAGE 58

PERIOD ENDING 815EP30 RCS: LOG-LCE(AR)7179

ALC:*ALC SCN: TYP EQP: ACF CAN: C123 WUC: 72113

CNTL &MPLFR AR291 CAT INF C

PART II - SHOP ACTIONS

FSC 5841 P/N 01-503C1-1 - NIIN/PPC CC6531683

--*CD* MALFUNCTION--- CODE	ACTION	REPAIR AFC UNITS	REPAIR AFC HOURS	ADJUST KL UNITS	ADJUST KL HOURS	CLN/TEST/OPSN V>Z UNITS	CLN/TEST/OPSN V>Z HOURS	SRVCBLE BJ UNITS	SRVCBLE BJ HOURS	PARTS & CONDEMNED 1 2-6 7-8 9 UNITS	PARTS & CONDEMNED HOURS	TOTAL UNITS	TOTAL HOURS	DELAYED COMN UNITS	DELAYED COMN HOURS
25F	AC CUTPUT	1	11.8		.0		.0		.0		.0	1	11.8		.0
	TOTAL	1	11.8		.0		.0		.0		.0	1	11.8		.0
BASE	ACTION														
YKL	*BALC HRS	1	11.8		.0		.0		.0		.0	1	11.8		.0
	TOTAL	1	11.8		.0		.0		.0		.0	1	11.8		.0

FSC 5841 P/N 02-503FR-1 - NIIN/PPC C00269774

--*CD* MALFUNCTION--- CODE	ACTION	REPAIR AFC UNITS	REPAIR AFC HOURS	ADJUST KL UNITS	ADJUST KL HOURS	CLN/TEST/OPSN V>Z UNITS	CLN/TEST/OPSN V>Z HOURS	SRVCBLE BJ UNITS	SRVCBLE BJ HOURS	PARTS & CONDEMNED 1 2-6 7-8 9 UNITS	PARTS & CONDEMNED HOURS	TOTAL UNITS	TOTAL HOURS	DELAYED COMN UNITS	DELAYED COMN HOURS
901	INTERMITTENT		1.8		.0		.0		.0		.0		1.8	1	2.0
	TOTAL		1.8		.0		.0		.0		.0		1.8	1	2.0
BASE	ACTION														
AL2C	PICKUP AFP CH		1.8		.0		.0		.0		.0		1.8	1	2.0
	TOTAL		1.8		.0		.0		.0		.0		1.8	1	2.0

80

FSC 5841 P/N AR291 - NIIN/PPC C02127031

--*CD* MALFUNCTION--- CODE	ACTION	REPAIR AFC UNITS	REPAIR AFC HOURS	ADJUST KL UNITS	ADJUST KL HOURS	CLN/TEST/OPSN V>Z UNITS	CLN/TEST/OPSN V>Z HOURS	SRVCBLE BJ UNITS	SRVCBLE BJ HOURS	PARTS & CONDEMNED 1 2-6 7-8 9 UNITS	PARTS & CONDEMNED HOURS	TOTAL UNITS	TOTAL HOURS	DELAYED COMN UNITS	DELAYED COMN HOURS
127	ADJUST IMPROP	.0		1	.7		.0		.0		.0	1	.7		.0
	TOTAL	.0		1	.7		.0		.0		.0	1	.7		.0
BASE	ACTION														
YTFM	*STOVER AFB MAS	.0		1	.7		.0		.0		.0	1	.7		.0
	TOTAL	.0		1	.7		.0		.0		.0	1	.7		.0

FSC 5841 P/N AR291AFN22 - NIIN/PPC CC6531683

--*CD* MALFUNCTION--- CODE	ACTION	REPAIR AFC UNITS	REPAIR AFC HOURS	ADJUST KL UNITS	ADJUST KL HOURS	CLN/TEST/OPSN V>Z UNITS	CLN/TEST/OPSN V>Z HOURS	SRVCBLE BJ UNITS	SRVCBLE BJ HOURS	PARTS & CONDEMNED 1 2-6 7-8 9 UNITS	PARTS & CONDEMNED HOURS	TOTAL UNITS	TOTAL HOURS	DELAYED COMN UNITS	DELAYED COMN HOURS
037	FLUCTUATES	2	6.3		.0		.0		.0		.0	2	6.3	2	3.7
127	ADJUST IMPROP	3	4.5	2	2.8		.0		.0		.0	5	7.3	1	1.7
25F	NC CUTPUT	5	11.9		.0		.0		.0	2	5.0	7	16.9	5	15.7
30C	GRNCED ELECT	1	1.0		.0		.0		.0		.0	1	1.0		.0
383	LOOK ON WBL	13	21.0		.0		.0		.0		.0	13	21.0	2	5.9
799	NC EFFECT		.0		.0		.0	5	4.8		.0	5	4.8		.0
	TOTAL	24	44.7	2	2.8		.0	5	4.8	2	5.0	33	57.3	10	27.8

BASE ACTION

ALC:WRALC FCN: TYP EQP: ACF EAD: C123 WUC: 72113
CNTL AMFLEE AM291 CAT TAC C
PART II - SHOP ACTIONS

ALZG RICKENBKR AFB OH	16	29.0			.0		.0		2		5.0	18	34.0	7	21.9
YTFP WSTCWFR AFB MAS	8	15.7	2	2.8	.0	5	4.8				.0	15	23.3	3	5.1
TOTAL	24	44.7	2	2.8	.0	5	4.8		2		5.0	33	57.3	10	27.8
FSC 5826 P/N AM291AFN22				UNITS	2			FSC 5841 P/N AM291APN222				UNITS	1		
FSC 5841 P/N AM291AFX022				UNITS	1			FSC 5841 P/N AMAS1APN22				UNITS	2		

--WCD MALFUNCTION---	REPAIR AFG		ADJUST KL		CLN/TEST/CRSN VXZ		SRVCELE BJ		----WRTS & CONDEMNED---- 1 2-6 7-8 9	TOTAL		DELAYED CONN	
CODE WCUN	UNITS	WOURS	UNITS	WOURS	UNITS	WOURS	UNITS	WOURS	------UNITS------ WOURS	UNITS	WOURS	UNITS	WOURS
837 FLUCTUATES	1	1.3		.0		.0		.0		.0	1	1.3		.0
127 ADJUST IMPROP	1	6.0		.0		.0		.0		.0	1	6.0		.0
383 LOOS ON WBL	1	4.0		.0		.0		.0		.0	1	4.0	2	3.9
795 NC DEFECT		.0		.0		.0	1	1.3		.0	1	1.3		.0
TOTAL	3	11.3		.0		.0	1	1.3		.0	4	12.6	2	3.9

EASE WCUN													
ALZG RICKENBKR AFB OH	1	4.0		.0		.0		.0		.0	1	4.0	2	3.9
YTFP WSTCWFR AFB MAS	2	7.3		.0		.0	1	1.3		.0	3	8.6		.0
TOTAL	3	11.3		.0		.0	1	1.3		.0	4	12.6	2	3.9

	REPAIR AFG		ADJUST KL		CLN/TESTCRSN VXZ		SRVCELE BJ		--------WRTS & CONDEMNED------- 1 2-6 7-8 9	TOTAL	
	UNITS	HOURS	UNITS	WOURS	UNITS	WOURS	UNITS	WOURS	---------UNITS--------- WOURS	UNITS	WOURS
WUC TOTAL	24	69.6	3	3.5		.0	6	6.1	2	5.8	39	84.2

3

ALC:MALC SCN: TYP EQP: ACF EAD: C123 WUC: 72113
CNTL AMPLFR AM291 CAT INC C
PART III - PARTS REPLACED

FSC	PART NUMBER	MCN MALFUNCTION CODE	MALFUNCTION	REF SYM NOUN	BASE	QUANTITY CURR	QUANTITY SIX
5961	82-90647-2	037	FLUCTUATES	SWSRVGEN	WSTCVER AFB PAS		1
	82-90471-1	037	FLUCTUATES	SERVOAMP	WSTCVER AFB PAS		1
	82-90521-1	037	FLUCTUATES	SERVO	WSTCVER AFB PAS		1
		037	FLUCTUATES	SERVO	WSTCVER AFB PAS		1
		037	FLUCTUATES	SERVO	WSTCVER AFB PAS		1
		383	LOCK ON PAL		WSTCVER AFB PAS		1
	* P/N TOTAL*						4
5910	2CSA911472P8A	070	BROKEN	CAPACITOR	WSTCVER AFB PAS		2
5945	1789-1176F1	169	CONTACT DEF	K1	NRALC NRS		1
5905	5P14A	255	NO OUTPUT	TURN	WSTCVER AFB PAS		4
	UNKNOWN	088	DATA INCORRECT	V614	WSTCVER AFB PAS		1
6130	15-90479-1	901	INTERMITTENT	C91	RICKENBR AFB OH		1
	WUC TOTAL						15

REFERENCES

1. "Low Maintenance Hydraulic Accumulator" AFWAL-TR-81-2031, Aero Propulsion Laboratory, Air Force Wright Aeronautical Laboratories, AFWAL/POOS, W-PAFB, OH 45433

2. "Maintenance Actions, Man-hours and Aborts by Work Unit Code", USAF (HQ AFLC/LOEP), W-PAFB, OH 45433, 18 Nov 1981

3. "Summarized Maintenance Actions for Selected WUCs", USAF (HQ AFLC/LOEP), W-PAFB, OH 45433, 18 Nov 1981

END

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